

The Iron Age

INDEX TO
READING MATTER
PAGE 32.

A Review of the Hardware, Iron and Metal Trades.

INDEX TO
ADVERTISEMENTS
PAGE 19.

Published every Thursday Morning by DAVID WILLIAMS, No. 83 Reade Street, New York. Entered at the Post Office, New York, as Second-Class Matter.

Vol. XXXIV: No. 11.

New York, Thursday, September 11, 1884.

\$4.50 a Year, Including Postage.
Single Copies, Ten Cents.

The Ebbw Vale Iron and Steel Works.

The following description of the Ebbw Vale Works is reprinted from *Engineering*: These works, of which we publish a general plan, and the industries allied to them, form one of the most extensive and important business enterprises in South Wales. They were commenced by Jeremiah Homfray, who came into South Wales from Staffordshire. He was of the same family as the original owners of Perrydarren and Tredegar Works. In 1790 the Harfords became the proprietors, and in 1816 purchased from Featherstone and Monkhouse, the owners of Tredegar Works, the Sirhowy property. The Harfords, prior to coming to Ebbw Vale, were part owners of another iron works in conjunction with a Mr. Hill, who was the founder of the Blaenavon Works. Messrs. A. Darby & Co. acquired the property in 1844, and in 1848 annexed the adjoining Victoria Works. The latter had been commenced by the Monmouthshire Iron and Coal Company in 1836. Messrs. Darby & Co. subsequently added the Abercarn, Pontypool, Bandon and Abercarn estates to the enterprise, and finally in 1864 the whole was converted into a limited company as it now exists. We believe that Mr. Darby, the principal partner in A. Darby & Co., was also the chief proprietor of the Coalbrookdale Iron Company. Previously to the opening of the tram-road to Newport in 1879 the pig iron was conveyed to port on mules. The Ebbw Vale Works cover an area of 5000 acres, and, as will be seen from the plan, this area is mostly distributed in a long strip on the banks of the River Ebbw, so that it takes a visitor a considerable time to get from end to end. However, lines of rails are laid throughout, and by aid of a locomotive a good deal of ground can be got over in a day. Starting at the north end we first notice the four blast furnaces known as the Ebbw Vale furnaces, in order to distinguish them from the more recently erected Victoria furnaces at the southern end of the works. The former are of the modern type and are hooped with iron bands. They are all 60 feet high. Nos. 1 and 2 are 16 feet at the bosh, 7 feet 6 inches across the hearth, and 10 feet at the throat. Nos. 3 and 4 differ from the former two in being 18 inches larger across the bosh. There are four tuyeres in Nos. 1, 2 and 4, while No. 3 has five tuyeres, equally spaced, and a dry-rammed ganister hearth, which is said to give good results. At the time of our visit No. 1 furnace was on spiegel. The blowing engines for these furnaces are placed in buildings at each end of the range. The first contains two engines which were erected about five years ago, and are by the Coalbrookdale Iron Company. They are of the ordinary beam-engine type, having steam cylinders 45 inches in diameter, blowing cylinders 90 inches and a stroke of 6 feet. The steam pressure is 45 pounds and the pressure of blast $4\frac{1}{2}$ pounds. The engines are condensing, the air-pump being worked off the beam. The steam cylinders are jacketed, we are informed, with the exhaust steam which discharges into a double casing around the cylinders. The valves are double beat and are worked by roller gear. There is also an expansion-valve giving a cut-off at about half-stroke. The ornamental cast-iron work forms a notable feature in this engine-house, and has also been supplied by the Coalbrookdale Iron Company. To the right of this engine-house is a range of 14 Cornish boilers 35 feet long and 7 feet in diameter, the flue of each being 3 feet 6 inches in diameter. These boilers are all fired by the waste gases from the furnaces which are brought by an overhead wrought-iron tube connected to the down-comers by a brick culvert. The boilers may be, if necessary, fired by coal. All the main culverts in this part of the works can be cleaned by a flush of water.

served by 15 ordinary cast-iron pipe stoves. Figs. 1, 2, 3 and 4 show the manner in which these stoves were erected. The shells are composed of wrought-iron plates $\frac{3}{8}$ inch thick. The dome of the stove is first laid on the brick base and riveted together; it is then lifted to a certain height, and one circle of plates is riveted to it. The two are then lifted to the height of another circle of plates, and so on until the full height of the stove is attained. The lifting is done by means of a derrick or galloway, made of wood the upright sides of which are 12 inches square; the cross-bar on top is 12 x 15 inches, and is secured to the uprights by wrought-iron straps and bolts. The base is 12 x 10 inches and is strutted on both sides, as shown in the illustration. Two sheave-blocks are secured to the cross-bar by chains, and connected to the two geared hand crab winches. When the shell is half built, another two pairs of blocks are secured to the uprights of the derrick. Four crab winches are required to complete the stove, and the derrick is then moved to

junction with the former wrought-iron crank. The diameter of the crank-shaft in the bearings at the crank end is 20 inches, and the length 3 feet, the total length being 15 feet 2 inches. It is square where the fly-wheel is blocked and staked on. The steam pressure for this engine is 40 pounds, and it delivers in the same blast main as the last-described engine. The air-valves are of the horizontal type, with balance weights. At the back of this engine-house is a range of four Cornish boilers 40 feet long by 7 feet diameter, having a 4-foot flue and six Galloway tubes in each. They are all gas-fired, no provision being made for coal. Near these again, and convenient to the rails on which the Bessemer ladle carriage is brought from the furnace, are two cupolas used for assisting the furnaces when enough iron is not got from them, and for working up pig made on Saturdays and Sundays. A steam lift with overhead cylinder raises the materials for these cupolas. Ascending to the higher level on the hillside immediately at

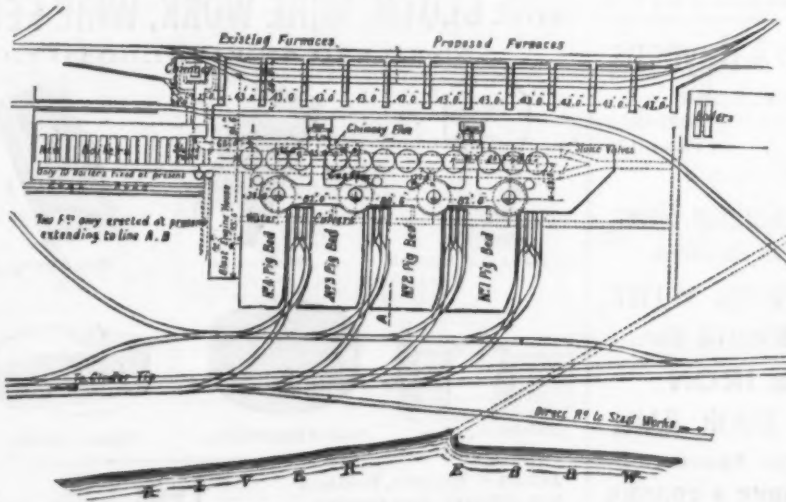
tools here, a horizontal single saw plank-cutting machine being the most prominent. The work is fed up by a table at a speed suited to the hardness of wood. The saw delivers itself by an arrangement in which the guides are placed at a slight angle. Here are also band saws, a circular bench saw, and other work-working machines, all by Messrs. T. Robinson & Son, Limited, of Rochdale. The power for these tools is obtained from a single-cylinder engine placed beneath the floor, and driving the shafting, also placed beneath the flooring, by means of cotton-ropes gearing. From here we pass to the large smiths' shops, consisting of three bays of light iron roofing 134 feet long and 123 feet deep in all. Here are 33 fires, a small steam hammer and a balling furnace. Adjoining the smithy is a fitting shop 176 feet long by 40 feet wide. In it are all necessary tools for keeping the engineering part of the establishment in repair. Rails are laid down the center, upon which one of the traveling

close to a building in which there is a line of rails, upon which the ladle is brought from the last furnaces at a sufficient height to enable the metal to be run direct to the converters by means of swinging troughs. The pit is 17 feet 6 inches radius, and has two side cranes for clearing away the ingots and shifting the molds. The center crane has a single ram of 21 inches diameter. The tipping gear is of the ordinary rack and pinion type, worked by a horizontal hydraulic cylinder. The converters are lined with silica bricks. The two other pits are of the old deep type, and have each two 8-ton converters.

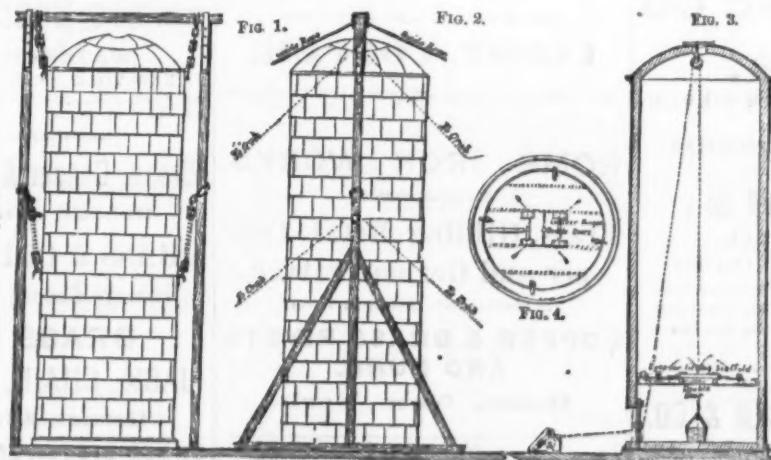
The blowing engines for this plant are two in number, one by Messrs. D. Adamson & Co., and the other by Messrs. W. & J. Galloway & Sons. The former is of the vertical direct-acting type, and comprises a pair of 40-inch steam cylinders, with 51-inch blast cylinders, by 5-foot stroke. The steam pressure is 50 pounds and the pressure of blast 25 pounds. A Buckley condenser is attached and is used when

water is very plentiful. The Galloway engines are a pair of horizontal 36-inch steam cylinders, 48-inch blast cylinders, and stroke 5 feet. They are non-condensing, the exhaust steam being taken to heat the feed-water. Both these engines deliver into the same blast main and take steam from the same boilers. Close by are three pairs of horizontal hydraulic pumping engines by Sir W. G. Armstrong & Co., for working the Bessemer plant and the rail mills. The steam cylinders are 18 inches, with $4\frac{1}{2}$ inch rams, to stroke 2 feet, and the water-pressure 450 pounds. In the rolling mills, besides the Bessemer plant, there is a pair of horizontal blooming engines by Messrs. W. & G. Galloway & Sons, geared 3 to 1. The cylinders are 36 inches in diameter and the stroke 4 feet 6 inches, steam pressure 50 pounds. There is one of Messrs. Hathorn, Davey & Co.'s separate condensers with a differential pump. This engine drives two trains of 36-inch rolls, one on each side. Further on is the rolling-mill train, 30-inch centers, which is driven by a pair of vertical engines geared $1\frac{1}{2}$ to 1, cylinders 50 inches in diameter and 4-foot stroke. From the finishing rolls the rails are taken to a swing saw by Messrs. Kitson & Co., of Leeds, and thence to the straightening presses, which consist of two double and one single presses in the first tier, and two double and two single in the second. A small steam hammer is also placed here. The heating furnaces are eight in number, and are gas-fired on the Siemens principle. They are of considerable depth, and are charged on each side. Hydraulic gear is used for pulling out. The gas-producers are placed close to the stream, the gas being carried over a railway in a wrought-iron tube. The latter discharges into a culvert which distributes the gas to the furnaces. There are six blocks of producers, with four fires in each block. The boilers running the steel works are 30 in number. Of these, 15 are quite new, and have been made by Messrs. D. Adamson & Co. They are 30 feet long and 7 feet in diameter, and have each one flue 3 feet 10 inches in diameter, and two cross tubes. Six more of these boilers are on Galloway's plan, and are of the same length and diameter. Another series of nine are by the Coalbrookdale Company, and are 34 feet long and 7 feet 1 inch diameter, having each two flues 2 feet 6 inches in diameter. The last nine are fired underneath; the others are internally fired, coal only being used.

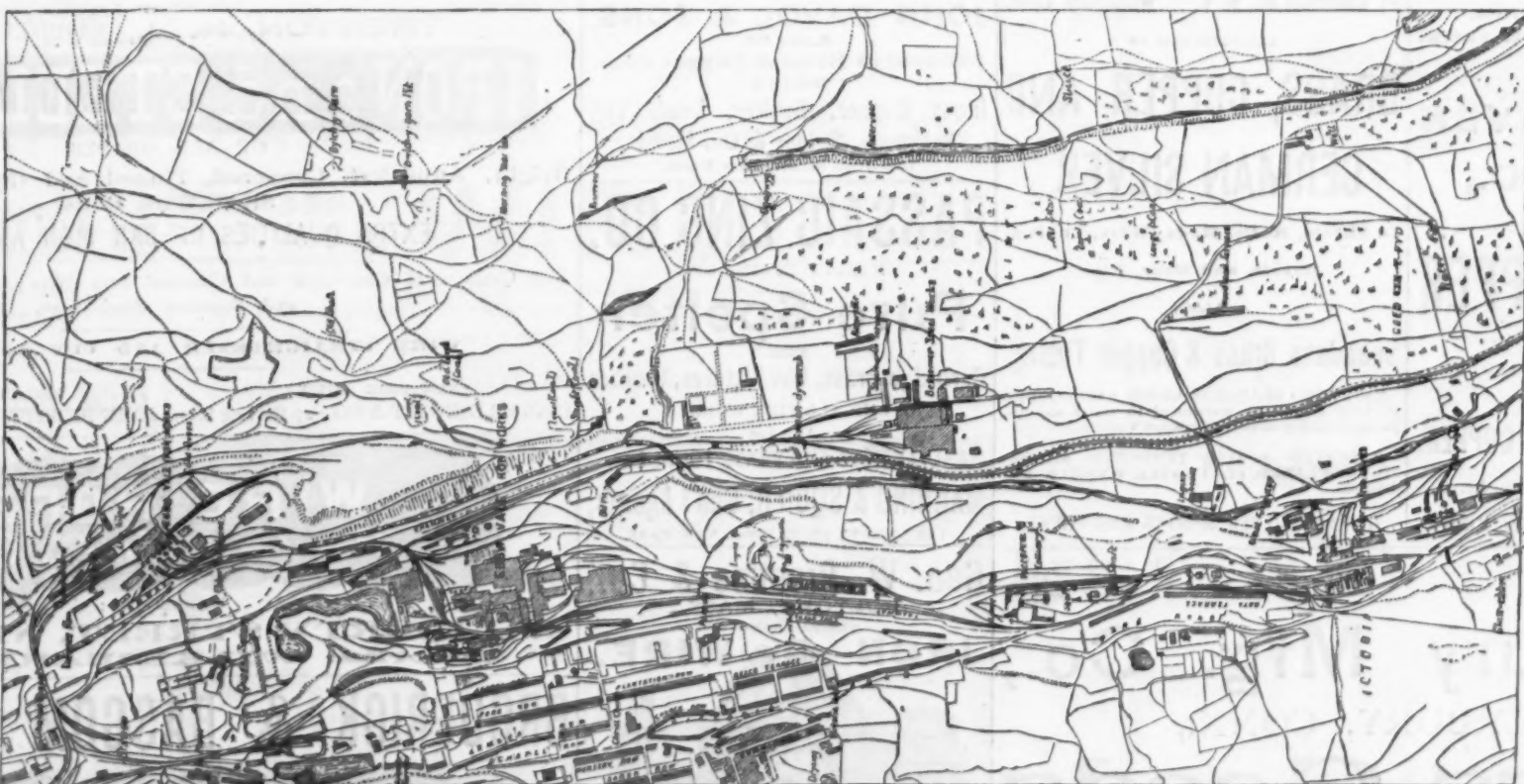
Leaving the steel works we pass on to the Victoria furnaces, and on the way we notice, away to the east of the line we travel on, two engine-houses situated on the banks of the stream. These contain two pumping engines which are for taking back the water which has been used for boilers, condensers, water tuyeres, and, above all, for the coal-washing machinery. One is a Cornish pumping engine with a 60-inch steam cylinder, a 17-inch plunger and a 6-foot 7-inch stroke. The second engine has a 40-inch steel cylinder by



Plan of Victoria Furnaces.



Methods of Erecting Couper's Hot-Blast Stoves.



PLAN OF THE EBBW VALE IRON AND STEEL WORKS.

the next stove base. The brick lining is built in by means of a movable scaffold composed of four planks 12 x 3 inches, boarded on top with $1\frac{1}{2}$ inches boarding, with folding doors in center to allow the tub to pass up through, and also to prevent bricks, &c., falling down on the men below. The bricks and clay are lifted in wooden tubs by means of a small steam winch. For lifting the scaffold the chain is taken off the tub and connected to the four chains on the scaffold. When the latter is lifted to the required height, four pins are put through staples on the scaffold, their ends resting on the brick-work. The checkered work and flame flue are built after the lining is completed.

At the opposite end of the blast furnaces is an engine-house containing a blowing engine of the ordinary beam type. The steam cylinder is 72 inches, the blowing cylinder 144 inches and the stroke 12 feet. The fly-wheel is 30 feet in diameter, and weighs 90 tons. It makes 12 revolutions per minute. This engine was started about 18 years ago, and on the second day of running the cast-iron crank broke. One of wrought iron was then substituted, and the engine ran very well until about five years ago, when the crank shaft broke short off in the journal at the crank end. A Whitworth fluid-pressed steel crank-shaft and crank-pin were then fitted, and these are at present in use in con-

junction with the former wrought-iron crank. The diameter of the crank-shaft in the bearings at the crank end is 20 inches, and the length 3 feet, the total length being 15 feet 2 inches. It is square where the fly-wheel is blocked and staked on. The steam pressure for this engine is 40 pounds, and it delivers in the same blast main as the last-described engine. The air-valves are of the horizontal type, with balance weights. At the back of this engine-house is a range of four Cornish boilers 40 feet long by 7 feet diameter, having a 4-foot flue and six Galloway tubes in each. They are all gas-fired, no provision being made for coal. Near these again, and convenient to the rails on which the Bessemer ladle carriage is brought from the furnace, are two cupolas used for assisting the furnaces when enough iron is not got from them, and for working up pig made on Saturdays and Sundays. A steam lift with overhead cylinder raises the materials for these cupolas. Ascending to the higher level on the hillside immediately at

tools here, a horizontal single saw plank-cutting machine being the most prominent. The work is fed up by a table at a speed suited to the hardness of wood. The saw delivers itself by an arrangement in which the guides are placed at a slight angle. Here are also band saws, a circular bench saw, and other work-working machines, all by Messrs. T. Robinson & Son, Limited, of Rochdale. The power for these tools is obtained from a single-cylinder engine placed beneath the floor, and driving the shafting, also placed beneath the flooring, by means of cotton-ropes gearing. From here we pass to the large smiths' shops, consisting of three bays of light iron roofing 134 feet long and 123 feet deep in all. Here are 33 fires, a small steam hammer and a balling furnace. Adjoining the smithy is a fitting shop 176 feet long by 40 feet wide. In it are all necessary tools for keeping the engineering part of the establishment in repair. Rails are laid down the center, upon which one of the traveling

close to a building in which there is a line of rails, upon which the ladle is brought from the last furnaces at a sufficient height to enable the metal to be run direct to the converters by means of swinging troughs. The pit is 17 feet 6 inches radius, and has two side cranes for clearing away the ingots and shifting the molds. The center crane has a single ram of 21 inches diameter. The tipping gear is of the ordinary rack and pinion type, worked by a horizontal hydraulic cylinder. The converters are lined with silica bricks. The two other pits are of the old deep type, and have each two 8-ton converters.

The blowing engines for this plant are two in number, one by Messrs. D. Adamson & Co., and the other by Messrs. W. & J. Galloway & Sons. The former is of the vertical direct-acting type, and comprises a pair of 40-inch steam cylinders, with 51-inch blast cylinders, by 5-foot stroke. The steam pressure is 50 pounds and the pressure of blast 25 pounds. A Buckley condenser is attached and is used when

(Continued on page 5.)

ANSONIA BRASS AND COPPER CO.,
MANUFACTURERS OF
PURE COPPER WIRE,
For Electrical Purposes,
Bare and Covered.
O'NEIL'S PATENT PLISHED
COPPER.
Seamless Brass and
Copper Tubing,
Sheets, Bolts, Rods,
Wire, O'Neil's
Patent Nickel-
Plated Copper,
&c.,
—IN—

W. E. DODGE
Pres't.
G. P. COWLES,
V.-P. and Treas.
A. A. COWLES,
Secretary.

*Ansonia Refined Ingot
Copper, Anchor Brand;
LAKE INGOT COPPER.*

19 & 21 CHURCH STREET,
NEW YORK.

PHELPS, DODGE & CO.,
IMPORTERS OF
TIN PLATE,
ROOFING PLATE,
Sheet Iron Copper, Pig Tin, Wire,
Zinc, &c.
MANUFACTURERS OF
COPPER AND BRASS.
CLIFF STREET, NEW YORK.

SCOVILL MFG CO.
BRASS,
HINGES WIRE, GERMAN SILVER.
PHOTOGRAPHIC GOODS.
BUTTONS,
CLOTH AND METAL.
DEPOTS: 419 & 421 Broome St., N. Y.
177 Devonshire St., Boston.
83 Lake St., Chicago.
FACTORIES: Waterbury, Conn.
New Haven, Conn.
New York City.

DICKERSON, VAN DUSEN & CO.,
Importers of
Tin Plate, Pig Tin, Sheet Iron, Copper,
Wire, Zinc, Etc.
29 & 31 CHURCH ST., cor. Fulton,
DICKERSON & CO., Liverpool. NEW YORK.

**THE NEW HAVEN
COPPER CO.,**
SOLE MAKERS OF
POLISHED COPPER
Under Patent of T. James, Sept. 12, 1876.
ALSO MANUFACTURERS AND
DEALERS IN
BRAZERS & SHEATHING COPPER,
Kettles, Bottoms, Bolts, Circles, &c.
290 Pearl Street - NEW YORK.


Waterbury Mfg. Co.,
WATERBURY, CONN.,
Brass Goods
This Advertisement Changes Weekly.

John B. Macready
98 Reade St.,
NEW YORK.

89 Lake St.,
CHICAGO.

STAUFFER, MACREADY & CO., New Orleans, La.
CARLIN & FULTON, Baltimore, Md.
FAKER & HAMILTON, San Francisco and Sacramento, Cal.

WORCESTER WIRE CO.,
Manufacturers of
**IRON AND STEEL
WIRE**
For all Purposes.
WORCESTER, MASS.


Waterbury Brass Co.
ESTABLISHED 1845.
Sheet, Roll and Platers' Brass,
GERMAN SILVER,
Copper, Brass and German Silver Wire
BRASS AND COPPER TUBING,
COPPER RIVETS AND BURS,
BRASS KETTLES,
Door Rail, Brass Tags,
PERCUSSION CAPS,
POWDER FLASKS,
Metallic Eyelets, Shot Pouches, Tape Measures, &c.
And small Brass Wares of every Description.
Cartridge Metal in Sheets or Shells a Specialty.
Sole Agents for the

**Capwell Mfg. Co.'s Line of Sport-
ing Goods.**
DEPOTS: 296 Broadway, New York.
125 Eddy St., Providence, R. I.
Hills At
WATERBURY,
Conn.

POPE, COLE & Co.
**BALTIMORE
COPPER WORKS,**
No. 57 South Gay St., BALTIMORE, MD.,
Have always on hand and for sale
INGOT COPPER,
Also Cakes, of unequalled purity and toughness.

ROME IRON WORKS,
Manufacturers of
Brass, Gilding Metal, Cop-
per and German Silver
(In Sheets, Rods, Tubing or Wire),
**COPPER & BRASS RIVETS
AND BURS.**
Rome, New York.

BROWN & BROTHERS,
81 Chambers St., N. Y. Waterbury, Conn.

**BRASS, COPPER AND
GERMAN SILVER**
In Sheets, Rolls, Rods, Wire, Tubing,
Rivets, and Burs, Etc.
ALSO,
Seamless Brass & Copper Tubing.
PATENTED SEAMLESS BRASS AND COPPER
HOUSE BOILERS, warranted to stand 300 lbs.
pressure and guaranteed against vacuum.
PATENTED SPRING TEMPERED SHANK,
SILVER-PLATED, FLAT TABLE WARE, in rich
designs.
GERMAN SILVER SPOONS AND FORKS.

H. S. CHASE,
Sec'y & Treas.

**The Plume & Atwood
Mfg. Company,**
MANUFACTURERS OF
SHEET and ROLL BRASS and WIRE,
German Silver and Gilding Metal,
Copper Rivets and Burs,
Copper Electrical Wire, Pins,
Brass Butt Hinges,
Jack Chain,
Kerosene Burners,
Lamp Trimmings, &c.
18 Murray Street, New York.
13 Federal Street, Boston.
109 Lake Street, Chicago.
Rolling Mill, THOMASTON, Ct. | Factories, WATERBURY, Ct.

Bridgeport Brass Co.,
MANUFACTURERS OF
Sheet and Roll Brass,
Brass & Copper Wire & Tubing,
Seamless and Brazed Tubing,
Copper and Iron Rivets.
OILERS and CUSPADORES, LAMPS and TRIMMINGS,
KEROSENE BURNERS, PLUMBERS' MATERIALS.
Clocks & Fly Fan Movements.
Particular attention paid to cutting out Blanks
and manufacturing Metal Goods.
MANUFACTORY, Bridgeport, Conn. | WAREHOUSE,
19 Murray St., N. Y.

Holmes, Booth & Haydens,
WATERBURY, CONN.
NEW YORK, BOSTON,
25 Park Place, 18 Federal St.
Manufacturers of all kinds of
Brass, Copper & German Silver,
ROLLED AND IN SHEETS.
BRASS & COPPER WIRE,
Tubing, Copper Rivets & Burs.
**BRASS & IRON
JACK CHAIN, DOOR RAIL,**
German Silver Spoons,
SILVER PLATED FORKS & SPOONS,
Kerosene Burners, &c.

JOHN DAVOL & SONS,
Agents for
Brooklyn Brass & Copper Co.,
Dealers in
Ingot Copper, Spelter, Lead, Tin,
Antimony, Solder & Old Metals,
100 John Street, New York.

PASSAIC ZINC CO.
MANUFACTURERS OF
Pure Spelter
FOR
Cartridge Brass, Gas Fixtures, Bronzes
AND ALL FINE WORK.
Also for
GALVANIZERS AND BRASS FOUNDERS.

MANNING & SQUIER, Gen'l Agents,
111 LIBERTY ST. (2d Floor), NEW YORK.

Geo. W. Prentiss & Co.,
HOLYOKE, MASS.,
MANUFACTURERS OF
IRON WIRE.


Bright, Coppered, Annealed and Tin
Plated. Also GUN SCREW WIRE
Of all sizes straightened and cut to order.

OLD COLONY RIVET CO.,
KINGSTON, MASS.
RIVETS
TINNERS AND ALL OTHER
NORWAY IRON
7/16 INDIAN & SMALLER
ALL LENGTHS & STYLES.

E. JENCKES MANFG. CO.,
PAWTUCKET, R. I.,
Bright Wire Goods, Bolt Hooks,
SPRING PINS, KEYS AND COTTERS.
Best Wire Goods of all kinds a Specialty.
New York Office, 88 Chambers Street.
SAMUEL A. HAINES Selling Agent.

PHILIP L. MOEN, President and Treasurer. CHAS. F. WASHBURN, Vice President & Secretary.
WASHBURN & MOEN MANUFACTURING CO.
Established 1831. WORCESTER, MASS.



MANUFACTURERS OF
IRON and STEEL WIRE.
Patent Steel Barb Fencing, Patent Steel Wire Bale Ties.
WIRE RODS of all Grades: Round Iron, Rivet quality, 3/16 in. to 1/2 in., cut to any length. Owners and exclu-
sive Operators of the PATENT CONTINUOUS ROLLING MILL, producing Iron and Steel WIRE, in
coils of 100 pounds, without SEAM or WELD. Patent Galvanized Telegraph Wire, Market and Stone Wire,
Annealed Fence and Grape Wire in long lengths; Coppered Rail-Rail Wire; Rope, Bridge, Bolt, Screw, Rivet, Buckle
and Chain Wire. Wire for the manufacture of Card Clothing, Heddies, Reeds, &c. Piano-string Covering Wire,
Tinned Broom Wire and Tinned-plated Wire of all sizes. A specialty is made of Clock, Machinery, Gun Screw and
Spiral Spring Wire, and Refined Wire to Pattern for particular purposes, from selected stamps of Norway Iron.
Any grade of Wire furnished, Annealed, Bright, Polished, Coppered, Galvanized or Tin Plated. Wire furnished,
Straightened and Cut to any length. Steel Crinoline Wire, Patent Linen finish. Unriveted Steel Music
Wire. Steel Wire for Springs, Needles and Drills. Market Steel Wire kept in stock, all sizes.

WAREHOUSES: New York, 16 CHURCH, and 241 Pearl St.
Chicago, 107 and 109 Lake St.

"NATIONAL WIRE AND LANTERN WORKS."
Warehouse, 45 Fulton Street, New York.
HOWARD & MORSE,
MANUFACTURERS OF
WIRE CLOTH, WIRE WORK, WIRE FENCE & RAILING,
Also, HAND AND RAILROAD LANTERNS.

 No. 1, Star R. R. Lantern.
 Sand Screen.
 Coal Screen.
 Star Fire Department
Lantern, Ex. Heavy.

 Bank Railing, No. 4.
 Nest of Flour Sieves.
 Foundry Riddle.
 Bank Railing, No. 12.

ADAM S. HEWITT, President. JAMES HALL, Treasurer.
WM. HEWITT, Vice President. E. HANSON, Secretary.

**THE
TRENTON IRON COMPANY,**
(INCORPORATED 1877),
TRENTON, N. J., MANUFACTURERS OF
IRON and STEEL WIRE
OF ALL GRADES,
Bright, Annealed, Coppered, Tinned and Galvanized Iron and
Steel Wire Rods.
EXTRA QUALITIES OF BAR IRON AND RODS.

Best Qualities of Gun-Screw and Charcoal Iron Wire; Crucible, Siemens-Martin
and Bessemer Steel Wire.
WIRE STRAIGHTENED AND CUT TO LENGTHS.
NEW YORK OFFICE: COOPER, HEWITT & CO., 17 Burling Slip. PHILADELPHIA OFFICE:
JOHN HEWITT, Agent, 21 North Fourth St.

WIRE ROPE
HAZARD MFG CO
WAREHOUSES:
87 LIBERTY STREET, NEW YORK.
Works: WILKESBARRE, PA.

BRODERICK & BASCOM ROPE CO.,
WIRE ROPE
BRODERICK & BASCOM ROPE CO.
MANUFACTURERS OF
IRON & STEEL WIRE ROPE.
728 N. Main St., St. Louis, Mo.

A. LESCHEN & SONS,
Manufacturers of
WIRE ROPE
Hemp Packing
Twines.
903 & 905 N. Main St., ST. LOUIS, MO. Correspondence invited

W. S. ESTEY,
MANUFACTURER OF
WIRE CLOTHS
OF BRASS, COPPER,
IRON, GALVANIZED AND
STEEL WIRE, OF ALL
MESHES AND GRADES
Iron and Steel Locomotive Spark Wire Cloth. Riddles for Export and Foundry use. Coal
and Sand Screens. Iron Bolting Cloth. Wire Work of every description.
NO. 86 FULTON ST., NEW YORK.

O. LINDEMANN & CO.,
Manufacturers of
Japanned, Brass,
Tin Plate
and Wood
BIRD CAGES
Original Invention
and Patented of
Bright Metal Cages,
constructed without
solder.
254 Pearl St.
NEW YORK.

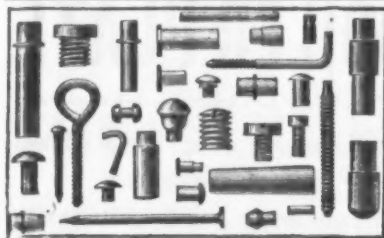


CARY & MOEN,
Manufacturers of
STEEL WIRE for all purposes and **STEEL SPRINGS** of every description.



Market Steel Wire, Crinoline Wire, tempered and covered.
Also Patent Tempered Steel Furniture Springs, constantly on hand.
934, 936 and 938 West 29th Street, NEW YORK.

THE FRED. J. MEYERS MANUFACTURING CO.
COVINGTON, Ky., Manufacturers of
WIRE GOODS OF ALL KINDS,
Wrought-iron Fencing, Cresting and Hardware Specialties.
Send for Illustrated Catalogue.



IRON AND BRASS RIVETS,
Studs, Pins, Screws, &c.,
For Manufacturers of Light Hardware.
BLAKE & JOHNSON, Waterbury, Conn.

LUDLOW-SAYLOR WIRE CO.,
ST. LOUIS, MO.

WIRE, WIRE CLOTH, WIRE ROPE,
Counter Railings, Window Guards, Iron and Wire Fences,
PLAIN AND BARBED FENCING WIRE.



CLEVELAND WIRE WORKS
W.S. Tyler
MANUFACTURER OF
Revolving Coal Screens,
Coal Yard Screens and
Foundry Riddles.
Wire Cloth of Every Description Made and
Carried in Stock.
CLEVELAND, OHIO.

STEEL FINGER BARS made by the new process
of the Gautier Steel Department of Cambria Iron
Co., at Johnstown, Pa., have been recently sub-
jected to competitive tests, and have proved
superior to any in the world in stiffness, strength
and elasticity.

Copies of tests and full information furnished
upon application.

GAUTIER STEEL DEP'T CAMBRIA IRON CO.,
Johnstown, Pa.

N. Y. OFFICE, 104 READE ST. CHICAGO OFFICE, 100 DEARBORN ST. PHILA. OFFICE, 523 ARCH ST.


[No. 81.]
CHARLES A. OTIS, President. SAM'L ANDREWS, Vice President. SAM'L A. BAGUE, General Manager.
THOS. JOPLING, Treasurer. JOHN C. ANDREWS, Secretary.
THE AMERICAN WIRE COMPANY,
DRAWERS OF
IRON AND STEEL WIRE OF EVERY DESCRIPTION

TELEGRAPH AND TELEPHONE WIRE.
GALVANIZED, TINNED AND COPPERED WIRE.
WIRE STRAIGHTENED AND CUT TO LENGTHS.
EASTERN OFFICE, ROOM 24, AMSTER HOUSE OFFICES, NEW YORK. E. C. PALMER, AGENT.
CLEVELAND, OHIO.
WESTERN OFFICE, ROOM 21, COMMERCIAL NAT'L BANK BUILDING, CHICAGO. BEN. PATTERSON, AGENT.

J. A. EMERICK **HOWARD EVANS**
MANUFACTURERS
MOLDERS' TOOLS,
FOUNDRIY FACING,
MOLDING SAND,
FOUNDRIY SUPPLIES.
J. A. EMERICK & CO.,
1056 to 1076 Beach St., PHILADELPHIA.




National Wire & Iron Co.
W. P. SUMNER, PRES. F. R. MINCKLER, SECY.
Detroit, Mich.
Cheese Saws, Wire Cloth, Wire Counter Railings, Wire Signs, Coring
Brushes, Sand & Coal Screens, Weather Vanes, Stable Fixtures, Roof
Cresting, Wire & Iron Fences, Iron Shutters, Counter Supports, &c.
Send for Catalogue. Mention this Paper.



The above cut represents Preston's Patent Braided Cable Wire Fence Rail, manufactured by the
HOLLOW CABLE MFG. CO., Hornellsville, N. Y. We also manufacture extensively
four different sizes Wire Clothes Lines. Send for Circulars and Price Lists.
Chamberlain & Miller, Western Agents, 89 Lake St., Chicago, Ill.

ESTABLISHED 1848. INCORPORATED 1870.
WM. CABLE EXCELSIOR WIRE MFG. CO.
43 FULTON STREET, NEW YORK,
MANUFACTURERS OF ALL KINDS OF
Brass, Copper and Iron Wire Cloth,
AND BRASS AND COPPER WIRE,
Coal and Sand Screens, Riddles, &c.

Estab'd 1818. Incorp'd 1874.
Gilbert & Bennett Mfg. Co.
42 CLIFF ST., NEW YORK,
MANUFACTURERS OF
Iron & Galvanized Wire
Sieves and Wire Cloth.
Power Loom Painted and Galvan-
ized Window Screen Wire Cloth,
Galvanized Wire Cloth for Drying
Fruits, World's Galvanized Web
Wire Fence, Galvanized Twist
Wire Poultry Netting.
Factories, Georgetown, Conn.



THOMPSON McCOSH, President. JOHN A. McCOSH, Sec. and Treas.
BARB WIRE **LIFTER AND CARRIER.**
NO DANGER OF CUT-
TING HANDS OR TEAR-
ING CLOTHES.
SAVES THE PRICE
THE LIFTER MAN
TIMES EVERY DAY.
Manufactured
Solely by
Hawkeye Steel Barb Fence Co.,
BURLINGTON, IOWA.




WE NOW OFFER this pattern of our first
class **Composite Wrought Iron Rail-
ing**, at the rate of \$1.50 per lineal ft. 3 ft. high.
The Chilled Iron Ornament is poured on to the
Wrought Iron Rods, welding the panel into one piece
without joints or crevices for rust to enter. It is made to
set on stone or to go into ground. Our Railings are
everlasting and one of them is worth two of any other
kind. Composite Iron Works Co. 83 Reade St., N. Y.



KELLY STEEL BARB WIRE.
Barbs 3 inches apart stand in all directions.
YIELDING STEEL BARB, ACTING LIKE A NATURAL THORN.
Lightest Weight per Rod. Painted and Galvanized. Only one Agent in each town. Address
THORN WIRE HEDGE CO.,
CHICAGO, ILL.



ROOF CRESTING,
Iron Fence, Railings, Stable Fittings,
BUILDERS' SPECIALTIES, &c.
J. E. BOLLES & CO.,
DETROIT, MICH., U. S. A.
Send for Catalogue. Mention this Paper.



WICKWIRE BROTHERS, CORTLAND, N. Y.,
MANUFACTURERS OF
WIRE CLOTH and WIRE GOODS,
Dish Covers,
Corn Poppers,
Coal Sieves,
Flour Sieves,
Etc., Etc.
"CORTLAND"
WINDOW SCREEN
WIRE CLOTH.
Metallic Sieve Sieve.



DEWITT WIRE CLOTH CO.
57 Chambers St., NEW YORK. 703 Market St., PHILADELPHIA.
MANUFACTURERS
Brass and Copper Wire,
WIRE CLOTH
of every description.
Double Selvage, Painted Wire Window Cloth
WIRE NETTING FOR FENCING,
POULTRY YARDS, &c.,
Wire Rope for Mines, Elevators, Cables and
Transmission of Power,
WIRE CORDS FOR PICTURES WINDOW SASHES, &c., &c.

PATENT OFFICE.
F. V. BRIESEN,
82 and 84 Nassau Street,
NEW YORK.

AMERICAN AND FOREIGN PATENTS
Solicited promptly and at the lowest rates.

WILLIAM MANN, JR., & CO.
LEWISTOWN, PA.,
MANUFACTURERS OF
RED WARRIOR
AXES, BROAD AXES,
Adzes, Broad Hatchets,
SPANISH AXES AND TOOLS.

OGDEN & WALLACE,
85, 87, 89 & 91 Elm St., New York.
Iron and Steel
Of every description kept in stock.
Agents for Park Brother & Co.'s
BLACK DIAMOND STEEL.
All sizes of Cast and Machinery Steel constantly on hand.

PIERSON & CO.,
ESTABLISHED 1790,
24 to 27 West St., cor. Morris,
NEW YORK CITY.

ULSTER IRON.

All Sizes and Shapes Kept in Stock.

NORWAY IRON

ROUNDS..... 1/2 in. to 1 in.
SQUARES..... 1/2 in. to 1 1/2 in.
FLATS..... 1/2 in. to 3 1/2 in.
SPECIAL PRICES FOR LOTS.
ALSO GENERAL ASSORTMENT OF
"ULSTER," "CATASAUQUA," "A. R. M. Co."
SHAFTING, REFINED & COMMON IRON.
BANDS, HOOPS & SCROLLS. STEEL
OF ALL KINDS.

ABEEL BROS.,
190 SOUTH ST., NEW YORK.
365 WATER ST., NEW YORK.
TELEPHONE CALL, "NASSAU, 379."

A. R. WHITNEY & CO.,
MANUFACTURERS OF AND DEALERS IN
Iron and Steel

AGENCIES:
PORTAGE IRON CO., Limited, Merchant Iron and
Soft Steel.
NORWAY STEEL & IRON CO., Homogeneous
Steel Plates.
BAY STATE IRON CO., Tank, Boiler and Girder
Plates.
BRANDYWINE ROLLING MILL, Boiler Plates.
GLASGOW TUBE WORKS, Boiler Flues.
A. M. BYERS & CO., Wrought Iron Pipe.
CARNEGIE BROS. & CO., Limited, Iron and
Steel Beams, Channels, Shapes and Shafting.
H. P. NAIL CO.'s Steel Wire Nails.
THE CHESTER PIPE AND TUBE CO.

Plans and estimates furnished and contracts
made for erecting Iron Structures of every descrip-
tion. Books containing cuts of all iron made sent
on application by mail. Sample pieces at office.
Please address 55 Hudson St. New York.

BORDEN & LOVELL,
Commission Merchants,
70 & 71 West St.,
NEW YORK.
Agents for the sale of

Fall River Iron Co.'s Nails,
Bands, Hoops & Rods,
AND
Borden Mining Company's
Cumberland Coals.

VOUGHT & WILLIAMS,
DEALERS IN
MACHINERY, TIRE AND
SPRING STEEL.
AGENTS FOR HELLER BROS.

Clay Crucible Cast Steel.
256 GREENWICH STREET, NEW YORK.

IMPORTED & AMERICAN
PIG IRON.

LAKE SUPERIOR CHARCOAL IRON,
For Malleable and Car-Wheel Purposes,
A SPECIALTY.

CHARLES HIMROD & CO.,
CHICAGO AND DETROIT.

PASSAIC ROLLING MILL CO.,
Manufacture and have always in stock
ROLLED IRON BEAMS,
Channels, Angles, Tees, Merchant Bars, Blotched Work,
Forgings, Eye Bars, &c.
PATERSON, N. J.
Room 45, Astor House, New York.

CUT NAILS.

Hot Pressed Nuts, Bolts, Washers, &c.

DOVER IRON CO.'S

BOILER RIVETS,

Boiler Brace Jaws, Socket Bolts, &c.

FULLER BROTHERS & CO.,

139 Greenwich Street, New York.

Marshall Lefferts & Co.,
90 Beekman St., New York City,

MANUFACTURERS OF

Galvanized Sheet Iron,
Best Bloom, Best Refined and Common.
Galvanized Wire Telegraph and Fence; Galvanized
Hoop and Band Iron, Galvanized Rod and Bar Iron,
Galvanized Nails, Galvanized Chain, Galvanized Iron
Pipe.

CORRUGATED SHEET IRON
For Roofing, &c., Galvanized, Plain or Painted.
Best Charcoal, Best Refined and Common
SHEET IRON.

Plate and Tank Iron.
C. No. 1, C. H. No. 1, C. H. No. 2 Flange, Best Flange,
Best Flange Fire Box, Circles.

ALL DESCRIPTIONS OF
Iron Work Galvanized or Tinned to Order.
Price list and quotations sent upon application.

FOX & DRUMMOND,
RAILWAY AND ROLLING MILL
MATERIAL,
68 Wall Street, NEW YORK.

JAMES WILLIAMSON & CO.,
SCOTCH AND AMERICAN

PIG IRON,
No. 63 Wall St., New York.

ULSTER IRON WORKS.
90 Broadway, New York.

Tuckerman, Mulligan & Co

CARMICHAEL & EMMENS
170, 172 & 174 Cedar St., New York; and
Nos. 21, 23, 25 & 7 West Lake St., Chicago, Ill.

IRON AND STEEL BOILER PLATE.
Lap-Welded Boiler Tubes, &c. &c.

Agent for The Costello Iron Co. The Laurel Roll-
ing Mills, and Union Tube Works; Wrought Iron
Beams, Angles, Tees, Rivets, &c.

DANIEL F. COONEY,
88 Washington St., N. Y.
BOILER PLATES AND SHEET IRON,
LAP-WELDED BOILER FLUES,
Boiler Rivets, Angle & T Iron, Cut Nails & Spikes.
Agency for Glasgow Iron Co., For L. Bailey & Co.
Fine Iron Works, Lebanon Rolling Mills, Chester
Pipe and Tube Co., Albany & Rens. Iron and Steel
Co.'s celebrated Boiler Rivets; Homogeneous Steel,
Boiler and Fire-Box Plates.

C. W. LEAVITT. EDW. CORNING.
C. W. LEAVITT & CO., 161 BROADWAY,
NEW YORK.
NEW AND SECOND-HAND
RAILS, LOCOMOTIVES AND CARS.
PIG AND BAR IRON, OLD RAILS AND SCRAP IRON.
(ALLENTOWN ROLLING MILLS,
ATWOOD HEMP CAR WHEEL CO.,
PARDEE CAR & MACHINE WORKS.)

B. F. JUDSON,
Importer of and Dealer in
SCOTCH AND AMERICAN

Pig Iron,
Wrought & Cast Scrap Iron,
OLD METALS.

457 & 459 Water St., NEW YORK.
233 & 235 South St., NEW YORK.

BOXWOOD RULES
And Miscellaneous Measures
IN FULL STOCK AT BOTTOM PRICES.

WM. H. BELCHER,
MANUFACTURER AND IMPORTER,
89 Chambers Street, NEW YORK.
CATALOGUES READY.

WM. McFARLAND,
Iron and Brass Founder,
TRENTON, N. J.

Chilled Cast Wire Dies a Specialty.
Any size or style made at short notice.

OXFORD
IRON AND NAIL CO.,
Cut Nails
AND
SPIKES.

J. S. SCRANTON, Sales Agent,
87, 89 and 91 Washington Street,
NEW YORK.

JOHN W. QUINCY & CO.,
98 William St., New York,
Anthracite, Charcoal, Scotch and
English Pig Iron.
Cut Nails, Ingot Copper, Tin, Lead, and
Metals Generally.

HARRISON & GILLOON
IRON AND METAL DEALERS,
558, 550, 552 WATER ST. & 323, 324, 326 CHERRY ST.,
NEW YORK.
have on hand, and offer for sale, the following:
Scotch and American Pig Iron, Wrought, Cast and
Machinery Scrap Iron, Car Wheels, Axles and Heavy
Wrought Iron; also old Copper, Composition, Brass,
Lead, Pewter, Zinc, &c.

BURDEN'S
HORSE SHOES.

"Burden Best"
Iron

Boiler Rivets.

The Burden Iron Company
Troy, N. Y.

ULSTER
AND
BURDEN'S

H. B. & S. Bar Iron.
Also Best Grades of

American & English Refined Iron.
All sizes and shapes in stock.

EGLESTON BROS. & CO.,
166 South St., NEW YORK CITY.
267 Front St., NEW YORK CITY.

WILLIAM H. WALLACE & CO.,
IRON MERCHANTS
Cor. Albany & Washington Sts.,
NEW YORK CITY.

WM. H. WALLACE, WM. BISPHAM, E. C. WALLACE.

BOLT & RIVET CLIPPERS.
For cutting off the ends of Bolts and Rivets, on
carriages, wagons, harness, etc. Ask for them
where you buy your hardware, or send for cir-
lar and price list.

CHAMBERS, BROTHER & CO.,
53d St., below Lancaster Ave.,
Philadelphia, Pa.

R. D. WOOD & CO.,
Philadelphia,
Manufacturers of

Cast Iron Pipe
FOR WATER AND GAS,
Lamp Posts, Valves, &c.,
Mathew's Pat. Anti-Freezing Hydrants.
400 CHESTNUT STREET.

SPRAY FEED WATER
PURIFIER
FOR STEAM BOILERS
L. & J. MORTON, 92 N. 3rd St.

ALL SIZES
of Corrugation
from
1 1/2 to 5 inches.

THE JERSEY CITY GALVANIZING CO.,
MANUFACTURERS OF
GALVANIZED MATERIAL OF EVERY DESCRIPTION.
GALVANIZING IN ALL ITS BRANCHES.
Galvanized Sheet Iron—Best Bloom, Best Refined, Common. Galvanized Round, Square Band and
Hoop Iron, &c., &c.

Corrugated Sheet Iron a Specialty, Galvanized, Black and Painted. Iron Corrugated for the Trade.
Estimates furnished on application.

WORKS GREEN AND BAY STREETS, JERSEY CITY, N. J. OFFICE AND WAREHOUSE, 98 JOHN STREET, NEW YORK.

W. D. WOOD & CO., L'd



Planished Sheet Iron.
Patented March 14th, 1865; April 8th, 1873;
Sept. 9th, 1873; Oct. 6th, 1874; Jan. 11, 1876.

Guaranteed fully equal in all respects to the
IMPORTED RUSSIA IRON,
and at a much less price.

FOR SALE
by all the principal

METAL DEALERS
In the Large Cities throughout
THE UNITED STATES,
And at their Office,
111 Water Street, PITTSBURGH, PA.

SYRACUSE MALLEABLE
IRON WORKS,
SYRACUSE, N. Y.

Mower and Reaper Castings
and Carriage Irons a
Specialty.

W. B. BURNS, Proprietor.

PENNSYLVANIA IRON WORKS
Everson, Brown & Co.,
SECOND AVE., PITTSBURGH, PA.,
MANUFACTURERS OF

Light Sheet Iron.
ROOFING SHEET
of all grades a specialty.
Prices quoted promptly upon application.

CORRUGATED AND CRIMPED IRON
ROOFING & SIDING,
Iron Buildings, Roofs,
Sheds, Doors, Cornices,
Skylights, Bridges, &c.
MOSELEY IRON BRIDGE AND ROOF CO.,
5 Day Street, New York.

GEORGE WESTINGHOUSE, JR., Pres't. JOHN CALDWELL, Treas. T. W. WELSH, Supt.
H. H. WESTINGHOUSE, Gen'l Agt. W. W. CARD, Secy.

Westinghouse Air-Brake Co.
PITTSBURGH, PA., U. S. A.,
MANUFACTURERS OF THE
WESTINGHOUSE AUTOMATIC BRAKE, Westinghouse Locomotive Driver
Brake, Vacuum Brakes (Westinghouse & Smith Patents).

WESTINGHOUSE FREIGHT BRAKE.
The Automatic Freight Brake is essentially the same apparatus as the Automatic Brake for
passenger cars, except that the various parts are so combined as to form practically one piece of
mechanism, and is sold at a very low price. The saving in accidents, flat wheels, brakemen's wages,
and the increased speed possible with perfect safety, will repay the cost of its application within
a very short time.

The "Automatic" has proved itself to be the most efficient Train and Safety Brake known. Its
application is instantaneous; it can be operated from any car in the train if desired, and should the
train separate, or hose or pipe fail, it applies automatically. A GUARANTEE is given customers
against loss from PATENT SUITS on the apparatus sold them.

The WESTINGHOUSE BRAKE is now fitted to upward of
15,000 ENGINES AND 80,000 CARS,
and is adopted by the principal Railways in all parts of the world.

FULL INFORMATION FURNISHED ON APPLICATION.

LEECHBURG IRON WORKS.
KIRKPATRICK & CO., Limited,
Manufacturers of all grades of
FINE SHEET IRONS,
Refined Cold Rolled, Show Card, Stamping, Tea Tray, Polished, Shot, Ferrule Iron, &c.)
NATURAL GAS USED AS FUEL.

OFFICE, No. 143 First Ave., Pittsburgh, Pa. WORKS, Leechburg, Pa.

CHAMPION
HOG RINGER
RINGS and HOLDER.
Only double ring ever
invented. The only
ring that will effectu-
ally keep hogs from
rooting. No sharp
points in the nose.

Ringers, 75c. Rings, 50c. 100. Holders, 75c. Huskers, 15c.
CHAMBERS, BERING & QUINLAN, Exclusive Manufacturers Decatur, Ill.

JOHN J. SPOWERS, President. **ALEXANDER BURNS, Manager.**

THE JERSEY CITY GALVANIZING CO.,
MANUFACTURERS OF
GALVANIZED MATERIAL OF EVERY DESCRIPTION.
GALVANIZING IN ALL ITS BRANCHES.
Galvanized Sheet Iron—Best Bloom, Best Refined, Common. Galvanized Round, Square Band and
Hoop Iron, &c., &c.

Corrugated Sheet Iron a Specialty, Galvanized, Black and Painted. Iron Corrugated for the Trade.
Estimates furnished on application.

WORKS GREEN AND BAY STREETS, JERSEY CITY, N. J. OFFICE AND WAREHOUSE, 98 JOHN STREET, NEW YORK.



STEEL TOE CALKS.

Extra Quality Homogeneous Steel

BOILER PLATE

STEEL PLATES, all descriptions.

Cut Nails and Spikes, Plate and Sheet
Iron, all descriptions.

SHOENBERGER & CO., Pittsburgh, Pa.

WHEELING NAILS

Laughlin Nail Co.,

Junction Iron Co.,

W. K. ROSS,

GENERAL AGENT,
97 Chambers Street, New York.

Manhattan Rolling Mill.

J. LEONARD,

445 to 451 West St., 177 & 179 Bank St.,
NEW YORK,

Manufacturer of

HORSE SHOE IRON,

Toe Calk Steel,
Rods, Ovals, Half Ovals and Flats.

KEYSTONE ROLLING MILL, Limited.

Manufacturers

IRON

Pittsburgh, Pa.

Bonnell, Botsford & Co.,

Iron, Nails & Spikes.

YOUNGSTOWN, OHIO.

WILLIAM R. HART & CO.,
AMERICAN AND FOREIGN
PIG IRON, SPIEGELEISEN,
Steel Blooms, Crop Ends, Tin Plates, &c.
No. 224 South Third St. PHILADELPHIA.

HENRY LEVIS & CO.,
Manufacturers' Agents
For Iron and Steel Rails, Car Wheels, Boiler and
Sheet Iron and General Railway
Equipments,
Old Rails, Axles, and Wheels bought and sold.
224 S. 4th St., Philadelphia.

Heavy Rails, Light Rails,
Railway Fastenings,
STREET
Cambria Steel Rails.
RAILS.
ADDRESS:
Cambria Iron Co.,
Office, 218 South Fourth St., Philadelphia, Pa.
Works, Johnstown, Pennsylvania.

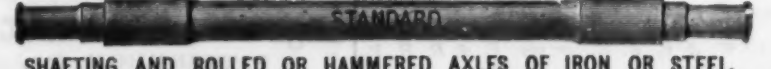
THE PHOENIX IRON CO.,
410 Walnut Street, PHILADELPHIA.
Manufacturers of Wrought Iron

Beams, Deck Beams, Channels, Angle & Tee Bars,
STRAIGHT AND CURVED TO TEMPLATE,
Largely used in the construction of Iron Vessels, Buildings and Bridges.
WROUGHT IRON ROOF TRUSSES, GIRDERS & JOISTS,
and all kinds of Iron Framing used in the construction of Fire Proof Buildings.
PATENT WROUGHT IRON COLUMNS, WELDLESS EYE BARS,
and built up shapes for Iron Bridges.
REFINED BAR, SHAPING, and every variety of SHAPED IRON made to order.
Plans and Specifications furnished. Address **DAVID REEVES, President.**
NEW YORK AGENTS, **MILLIKEN & SMITH, 95 Liberty Street.**
BOSTON AGENTS, **FRED. A. HOUDLETTE & CO., 19 Battery March St.**

ALAN WOOD & CO.,
MANUFACTURERS OF
Patent Planished, Galvanized, Common, Best Refined, Cleaned and Charcoal Bloom
PLATE & SHEET IRON,
ALSO LIGHT PLATES AND SHEETS OF STEEL,
No. 519 Arch Street, Philadelphia, Pa.
Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smoke Stack,
Tank and Boat Iron; Last, Stamping, Ferrule, Locomotive Headlight and Jacket Iron.

W. H. WALBAUM & CO.,
206 S. Fourth St., Philadelphia. 61 Pine St., New York.
NEW AND OLD RAILS, BLOOMS, BESSEMER PIG,
Crop Ends, Spiegeleisen, Iron Ores and Railroad Supplies Generally.
AGENTS IN THE UNITED STATES FOR
THE NORTH LONSDALE IRON & STEEL CO., Limited, Bessemer Pig Iron, brand
"Ulverston;" Malleable Pig Iron, brand "U. H. M."
MOSS BAY HEMATITE IRON & STEEL CO., Limited, Spiegeleisen, Crop Ends, &c.
Also for "Lorn" Malleable Charcoal Pig Iron and
N. B. ALLEN & CO.'S Dinas Fire Bricks.

NAILS
JAS. ROWLAND & CO.,
Kensington Iron, Steel & Nail Works,
220 North Delaware Ave., - PHILADELPHIA,
Manufacturers of the
ANVIL BRAND REFINED MERCHANT BAR IRON.
Also, the James Rowland & Co. Kensington ★ Nails, cut from
their Refined Anvil stock. Also, Plow and Cultivator Steel; Skelp
Iron a specialty; also Rounds, Squares, Flats, Bands and Hoop
Iron.

PENCOYD IRON WORKS.
A. & P. ROBERTS & CO.,
MANUFACTURERS OF
BEAMS, CHANNELS, DECK BEAMS,
ANGLES, TEES, PLATES, MERCHANT BAR.

SHAFTING AND ROLLED OR HAMMERED AXLES OF IRON OR STEEL
Office, No. 26 S. Fourth St., Philadelphia. Agents for the sale of Glamorgan Pig Iron.

J. W. PAXSON & CO.,
DEALERS IN
MOULDING SAND,
1021 North Delaware Avenue, PHILADELPHIA, PA.


MANUFACTURERS
CHARCOAL FACING,
ANTHRACITE FACING,
SOAPSTONE,
LEAD FACING,
RIPPLES, SHOVELS,
STEEL BRUSHES.

THE ALLENTOWN ROLLING MILLS,
Manufacturers of
Rails, Bars, Axles, Shafting, Fish Bars (Plain and Angle), Spikes,
Rivets, Bolts and Nuts, &c. Bridges and Turn Tables.
General Office, 237 South Third St., Philadelphia. Works at Allentown, Pa.

SHENANDOAH IRON, LUMBER, MINING & MFG. CO.,
MANUFACTURERS OF
SUPERIOR COKE PIG IRON
FROM NEUTRAL HEMATITE ORES. Also
CHARCOAL PIG IRON AND BLOOMS FROM SAME ORES.
Works at MILFORD, PAGE CO., VA. Treasurer's Office, 132 WALNUT ST., PHILADELPHIA.
HOFFMAN, PARRY & CO., Sales Agents, 205 South 4th St., Philadelphia.

Edward J. Etting,
IRON BROKER AND COMMISSION MERCHANT,
222 S. Third St., Philadelphia, Pa.
Pig, Bar and Railroad Iron.
OLD RAILS, SCRAP, &c.
Agent for the
MOUNT SAVAGE FIRE BRICK,
The Allentown Iron Co. and the
Greenwood Rolling Mill.
STORAGE WHARF AND YARD
DELAWARE AVENUE ABOVE CALLOWHILL STREET,
connected by track with railroad.
Cash advances made on Iron.

JAS. G. LINDRAY. THOS. S. PARVIN.
LINDSAY, PARVIN & CO.,
Successors to LLOYD & LINDRAY,
328 Walnut Street, Philadelphia.
Iron Ship and Bridge Builders' Materials, Steel
and Iron Shapes and Bars, Sheet Iron, Sheet Steel,
Pig Iron, Muck Bars, Plate Girders for Bridges and
Buildings. Contracts placed for Iron Structures.

Ethelbert Watts. Jos. C. Poulter.
ETHELBERT WATTS & CO.,
Iron Brokers and Commission Merchants,
Office, No. 290 So. Third Street, Phila.
SALES AGENTS FOR
CORNWALL ORE BANK CO., IRON ORES.
CROMWELL IRON CO.,
VESTA FURNACE,
HARRISBURG FURNACES,
MESSRS. EVERETT & POST, PIG LEAD & SPECTER.
Chicago and St. Louis.
Correspondence Solicited.

L. & R. WISTER & CO.,
IRON COMMISSION MERCHANTS,
230 So. 4th St., Philadelphia.
AGENTS
Kemble and Norway Foundry and Forge Pig Iron.
Weybrooke C. B. Charcoal Pig Iron. Buchanan
Red Short Pig Iron.
DEALERS IN ALL KINDS OF SCRAP IRON.

MORRIS, WHEELER & CO.,
IRON, STEEL & NAILS.
WAREHOUSE AND OFFICES,
16th & Market Sts.,
PHILA., PA.
SALES OFFICES
400 Chestnut St.,
PHILA., PA.
New York Address, 14 CLIFF ST.

REUBEN HAINES,
CHEMIST,
738 Sansom St., Philadelphia.
Analysis of Ores of Iron and other Metals,
Pig Iron and Steel. Assay of Gold and
Silver Ores. Water Analysis for
Manufacturing and Household Use.

TAYLOR-LANGDON GAS-ROASTED
BESSEMER ORE,
Specially adapted to Soft Foundry or Highest
Grades of Mill Iron.

J. WESLEY PULLMAN,
407 Walnut St., PHILADELPHIA.

NORTH BROTHERS,
Iron Founders,
LIGHT CASTINGS A SPECIALTY.
N. W. Cor. 23d and Race Streets,
PHILADELPHIA.
Correspondence solicited.

TESTED CHAINS.
BRADLEE & CO., EMPIRE CHAIN WORKS,
816 Richmond St., - - - PHILADELPHIA.
Chains for Foundry Cranes and Slings.
"D. B. C." Special Crane Chain.
Steel and Iron Dredging, Slope and Mining Chains.
Ship's Cables and Marine Railway Chains.

CUMBERLAND NAIL AND IRON CO.,
MANUFACTURERS OF
"Cumberland" Nails and Wrought Iron Pipe,
43 North Water Street and 44 North Delaware Avenue, PHILADELPHIA.
J. TATNALL LEA & CO.,
Successors to CABEEN & CO.,
IRON COMMISSION MERCHANTS,
No. 400 Chestnut Street, Philadelphia.
BESSEMER, MILL AND FOUNDRY PIG IRON, SKELETON IRON, MUCK AND SCRAP BARS NATIVE
AND FOREIGN ORES. AGENTS FOR CONNELLSVILLE COKE.


LOCOMOTIVE AND CAR-WHEEL TIRES
Manufactured from the celebrated OTIS STEEL BRAND
✓ **STANDARD** ✓
Quality and efficiency fully guaranteed. Prices as low
as any of the same quality. We manufacture Heavy and
Light Forgings, Driving and Car Axles, Crank Pins, Piston
Rods, &c.
THE STANDARD STEEL WORKS,
Works at LEWISTOWN, PA.
Office: - - 220 S. 4th St., Philadelphia, Pa.

BOOTH, GARRETT & BLAIR,
ANALYTICAL AND CONSULTING CHEMISTS,
919 and 921 Chant St. 10th St. above Chestnut St., Philadelphia, Pa.
Established in 1836.
Analyses of Ores, Waters, Metals and Alloys of all kinds. A special department for the
ANALYSIS OF IRON AND STEEL,
fitted with all the apparatus and appliances for the rapid and accurate analysis of Iron, Steel, Iron
Ores, Slags, Limestones, Coals, Clays, Fire Sands, &c. Agents for sampling ores in New York and
Baltimore. Price lists on application.

JUSTICE COX, JR. CHARLES K. BARNES.
JUSTICE COX, JR. & CO.,
AGENTS FOR
CHICKIES, CONEWAGO, MONTGOMERY AND
SHENANDOAH
Foundry & Forge Pig Iron.
CARBON ROLLING MILL CO., Limited,
Best Quality Muck Bar.
CATASAUQUA MFG. CO.'S
Bar, Angle, Skelp and Sheet Iron.
Shenandoah (Va.) Best Charcoal Blooms.
No. 294 So. Fourth St., PHILADELPHIA.

JEROME KEELEY & CO.,
305 Walnut Place, Philadelphia.
SELLING AGENTS FOR
CHARCOAL and ANTHRACITE BLOOMS, PIG IRON,
BAR IRON, SHEET IRON, STEEL and IRON RAILS,
IRON CLAD STEEL RAILS and BARS, MAGNETIC
and HEMATITE IRON ORES, FIRE BRICK, COAL
and "OKEL" MUCK BARS. Handle Old Iron and Steel
Rails, Scrap Iron &c. Examine and negotiate sales
of Iron and Coal properties.

E. H. Wilson. A. Kaiser. J. B. M. Hiron.
E. H. WILSON & CO.,
330 South Third Street, Philadelphia.
BROKERS AND DEALERS IN
IRON AND STEEL.
Correspondence solicited.

J. W. HOFFMAN & CO.,
IRON COMMISSION MERCHANTS,
205 South Fourth St., Philadelphia.
SELLING AGENTS.
PINE IRON WORKS, Pine Brand Plates; GLASGOW
IRON CO. Plates and Muck Bars; SPRANG STEEL &
IRON CO. (Limited), Siemens-Martin (Open-Hearth)
Steel, Universal and Sheared Plates, Angles and
Shapes.

JNO. L. HOGAN. RICH'D M. ELLIOT.
HOGAN & ELLIOT,
411 & 413 WALNUT ST., PHILADELPHIA.

IRON AND ORES,
Old Rails, Wrought and Cast
Scrap, Iron and Steel Blooms
and Billets.

AGENTS FOR: Brier Hill Iron and Coal Co., Pig
Iron. Low Moor Iron Co., of Virginia, Pig Iron.
Mount Hope Special Strength Charcoal Pig Iron.
Youngstown Steel Co. Washed Metal, for Open
Hearth and Crucible purposes. Connellsville Coke.
Low Phosphorus Bessemer Pig Iron a Specialty.

ANDOVER PIG IRON,
FOR BEST MILL PRODUCTS.
Andover Chill Iron for Carwheels, &c.
Each pig marked exact chill depth 3/4 inch to 1 1/4
inch, A. Whitney & Son's standard test.
F. A. COMLY, Treas. J. WESLEY PULLMAN, Agent.
407 Walnut St., PHILADELPHIA.

J. J. MOHR,
Sole Agent for
Sheridan, Leesport, Temple,
Lynchburg, Millcreek and Mt.
Laurel
FOUNDRY & FORGE PIG IRON,
CHARCOAL PIG IRON.
450 Walnut St., PHILADELPHIA, PA.

(Continued from page 1.)

4-foot stroke. It is geared 4 to 1 on the
crank-shaft, and works two pumps with
12-inch barrels and 6-foot stroke. The large
pump discharges into a range of pipes 20
inches in diameter, by which the water is
taken a height of about 225 feet, from intake
to delivery, the distance being about 3/4 mile.
The second engine serves a 12-inch main,
which is placed beside the larger one. Both
these mains discharge into an artificial open
watercourse, which carries the water to a
small reservoir above the Ebbw Vale fur-
naces, the latter being in that part of the
works furthest up the valley. The advan-
tage of this water-saving system has been
strikingly manifested during the recent long
spell of dry weather, all through which the
Ebbw Vale Works had no lack of water.

We now arrive at the Victoria blast
furnaces, of which there are two now at
work. They are 60 feet high, 20 feet in
diameter at boshes, 8 feet at hearth, and 13
feet 9 inches at top. They have seven
tuyeres inserted at equal distances and a
water frame for the tuyeres. A tuyere can
also be placed in front if required. One
furnace has a fire-brick hearth and the other
is rammed with dry ganister. Both have
water blocks, and are rammed inside with
dry ganister round the furnaces. The furnaces
are hooped with iron in the same way as
those at the Ebbw Vale end. In addition to
these two furnaces, provision has been made
for two others which are about to be built.
The plan we give is of the complete arrange-
ment, but up to the present time only that
part on the left of the line A B is complete.
The blowing engines, two in number, are
placed in a handsome engine-house at the
end of the range. The engines are by
Messrs. Kitson & Co., of Leeds, and are of
the vertical type, with steam cylinders 50
inches in diameter above, and air cylinders
100 inches in diameter below. The stroke is
5 feet. The steam pressure is 60 pounds and
the blast 5 pounds. There are piston steam-
valves and circular blast-valves. In this
engine-house there is room for two more
engines of this type, the foundations for
which are already laid.

Under an iron roof adjoining is a range of
10 Adamson steel boilers 30 feet long and 7
feet in diameter, all of which are gas-fired.
The flues are 3 inches in diameter, and each
boiler has six cross tubes. There are two
Berrymann feed-water heaters, which take
the exhaust steam from the engines. In this
boiler shed are two of Messrs. Hathorn,
Davey & Co.'s horizontal pumps with differ-
ential gear for taking the tuyere water back
to a reservoir, and next to these is a
Cameron pump for feeding the boilers. All
the arrangements in this part of the works
are excellently designed and well carried
out, substantial brick shelters being provided
for the men, while the engine-house has
more the appearance of a water company's
station than a building for housing a blowing
engine. The depot for these blast furnaces
consists of seven bunkers, each 43 feet wide,
45 feet high and 50 feet deep. These are
at the tapping level, all materials being
lifted upon steam hoists by a pair of winding
engines with 12-inch cylinders and 20-inch
stroke, geared 5 to 1 with wire rope.

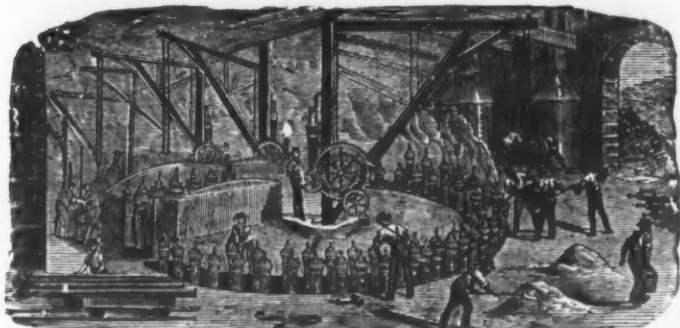
To the left of the blast furnaces is the
foundry where rolls and all necessary cast-
ings for works are made. Castings up to 30
tons have been turned out at this foundry.
Ascending the western slope of the valley a
line of rails takes us to the coke ovens, of
which there are seven blocks, or 180 in all.
Six of these are on the Coppée principle,
and supply heat by their waste gases to nine
boilers which are placed at the ends of the
blocks. They supply steam for two coal-
washing machines on the plunger principle,
which are close by. They also provide steam
for the engines required at the mouth of two
pits close by, and also for a pumping engine
which takes the coal-washing water back to
a tank on the top of the machine. Provision
is made for adding three more of these boil-
ers. It should be mentioned that there are
three steam "pushers out" for discharging
the Coppée ovens.

The bar mill is next reached on the return
tour toward the offices. Here is a 12-inch
train driven by an engine with cylinders 24
inches in diameter by 30 inches stroke, and
an 8-inch guide mill having an engine with
21-inch cylinders by 20-inch stroke. Both
these trains are to be driven by cotton rope.
The fly-wheel pulleys are 14 feet in diameter
and 2 feet wide, and have eight grooves.
The driven pulley on the 8-inch train is
6 feet 7 inches in diameter, while that on
the 12-inch train is 7 feet 7 inches. The
engine for the former mill will make 112
revolutions per minute, and the other 70
revolutions. Ropes 1 1/4 inches in diameter
will be used, and the distance between the
centers of the pulleys will be 30 feet. Rope
gearing for rolling mills is to a great extent
a novelty in this country, although we un-
derstand that it has been adopted to some
small extent in the North. In America,
however, it is not uncommon. On the other
side of these sheds is an 18-inch train for
rolling fish-bars and large-size iron and steel
bars up to 3 1/2 or 4 inches. It is driven by
a pair of horizontal engines made on the
premises and geared 3 to 1, with 30-inch
cylinders and 4-foot 6-inch stroke. In this
mill are seven boilers fired by the waste
heat from the heating furnaces. These are
each 24 feet long by 7 feet in diameter.
They have two tubes each 2 feet 6 inches in
diameter, one furnace delivering into each
flue.

From here we pass some old puddling fur-
naces and arrive at what are known as
No. 4 steel rolling mills, where a new 36-
inch blooming mill and pair of engines are
now being erected. The engines are by
Galloway & Son, and are geared 3 to 1.
They are 36 inches in diameter by 4 foot
6-inch stroke. This mill has helical pinions,
and the top rollers are balanced with hy-
draulic cylinders after the most approved
style. Hydraulic power is supplied for pass-
ing the bloom and also for turning over.
This fine train has been made on the prem-
ises and is an excellent example of ma-
chinery of this type. The horizontal guil-
lotine shears have also been made at the
works. The mill train, situated close to the
preceding, is worked by an old beam en-
gine with a horizontal engine coupled. It
is geared 2 1/2 to 1. There are 12 boilers

A. H. McNEAL,

BURLINGTON, N. J.



FLANGE PIPES.

General Foundry Work.

CAST IRON PIPES,

FOR WATER AND GAS.

ESTABLISHED IN 1848.

SINGER, NIMICK & CO., Limited,

PITTSBURGH, PA.,

MANUFACTURERS OF ALL KINDS OF

HAMMERED AND ROLLED

STEEL,

Warranted Equal to any Produced.

BEST REFINED TOOL CAST STEEL

For Edge and Turning Tools, Taps, Dies, Drills, Punches, Shear Knives, Cold-Chisels and Machinists' Tools generally.

SAW PLATES

For Circular, Mulay, Mill, Gang, Drag, Pit and Cross-Cut Saws.

Sheet Steel

For Springs, Billet Web and Hand Saws, Shovels, Cotton Gin Saws, Stamping Cold, &c., &c.

SIEMENS-MARTIN (Open-Hearth) PLATE STEEL

For Boilers, Fire-Boxes, Smoke-Stacks, Tanks, &c.

All our Plate and Sheet Steel being rolled by a Patented Improvement, is unequalled for surface finish and exactness of gauge.

ROUND MACHINERY CAST STEEL

For Shafting, Spindles, Rollers, &c., &c.

File, Fork, Hoe, Rake, R. R. Frog, Toe-Calk, Sleigh-Shoe and Tire Steel, &c.; Cast and German Spring and Plow Steel.

Iron Center "Cast Plow Steel." Finished Rolling Plow Coulters, with Patent Screw Hubs. Soft Steel Center "Cast Plow Steel." Agricultural Steel cut to any pattern desired. [attached] Solid Soft Center "Cast Plow Steel." Steel Forgings made to order.

Represented at 243 Pearl & 18 Chest Sts., New York, & 417 Commerce St., Philadelphia, by HOGAN & SON, General Agents for Eastern and New England States.

THE MIDVALE STEEL COMPANY,

CRUCIBLE AND OPEN-HEARTH STEEL.

TIRES and AXLES

OF EVERY DESCRIPTION.



Tool, Machinery and Spring Steel Castings and Forgings.

WORKS AND MAIN OFFICE, Nicetown, Philadelphia, Pa. BRANCH OFFICE, 333 Walnut St., Philadelphia, Pa.

"THE FRANKFORD STEEL WORKS,

STEEL FORGINGS,

NONPAREIL TOOL STEEL,

MACHINERY STEEL.

FRANKFORD, PHILADELPHIA, PA."

ESTABLISHED 1847.

A. WHITNEY & SONS,

PHILADELPHIA,

CHILLED RAILROAD WHEELS

For every kind of service, including Street, Mine and Lumber Trams. Wheels furnished in rough bored or on axles. Chilled castings made to order.

PENNSYLVANIA STEEL COMPANY,

Steel Rails, Frogs, Crossings & Switches.

Forgings for Piston Rods, Guide Bars, Wrist Pins and Machinery Purposes.

Works at Baldwin Station, Pennsylvania Railroad, near Harrisburg, Pa.

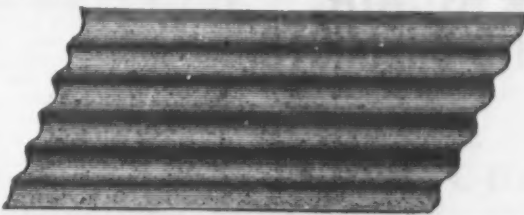
Address orders to

PENNSYLVANIA STEEL COMPANY, 208 South Fourth Street, Philadelphia.

129 & 131 So. Clinton St., KNISELY & MILLER, Chicago, Illinois.

MANUFACTURERS OF

CORRUGATED IRON,

PAINTED
OR
GALVANIZED,STRAIGHT
OR
CURVED.

THREE SIZES OF CORRUGATION.

We carry at all times a large stock from which we can fill orders promptly. Send for Catalogue and Prices.

JANSEN HERNSHEIM & CO.,

16 & 18 Exchange Place, NEW YORK.

STEEL RAILS, BLOOMS AND WIRE RODS,

Bessemer, Scotch and Charcoal Pig Iron,

FERROMANGANESE SPIEGEL IRON, SCRAP IRON, &c., &c.

BRITTON IRON AND STEEL CO.,

MANUFACTURERS OF

IRON AND STEEL BOILER PLATE,

Tank, Bridge and Ship Plates,

BLACK AND GALVANIZED SHEET IRON.

Works foot of Wason St., cor. L. S. & M. S. R. R.,

CLEVELAND, O.

CHARLES HUBBARD, 46 Cliff St., New York City,

HEAVY STEEL AND IRON FORGINGS,

For Marine and Stationary Engines.

Homogeneous Steel Boiler Plate, "Nashua" Brand. Best YORKSHIRE BAR, "TAYLOR" IRON, for Stamped Work, Screws, etc., etc.

MUSHET SPECIAL TOOL STEEL, requires neither tempering nor hardening. Estimates given.

Established 1861.

THOMAS C. BURROWS,

Agent for Jersey City Steel Company,

Manufacturers of

STEEL

Of All Descriptions.

WAREHOUSE, 99 and 101 JOHN ST., NEW YORK.

CALUMET IRON & STEEL CO.,

MANUFACTURERS OF

OPEN HEARTH STEEL, PIG METAL,

MERCHANT BAR, IRON AND NAILS,

SIEMENS OPEN HEARTH STEEL CASTINGS FOR RAILROAD, MACHINERY AND AGRICULTURAL PURPOSES.

Offices, First National Bank Building, Chicago, Ill.

C. R. CUMMINGS, President. Works at Cummings, Cook County, Ill. D. C. BRADLEY, Vice Pres. and Gen'l Man. J. M. BROWN, Sec'y & Treas.

Grove, Grier & Co., Limited,

Makers of

Open Hearth Steel Plates,

For Locomotive and Marine Boilers, Ship and Tank Plate, Spring, Tire, Machinery, Agricultural Steel, &c.

Office:

330 Walnut Street, - Philadelphia.

Furnace and Mills, Danville, Pa.

STANDARD STEEL CASTING CO.,

THURLOW, PA.,

Open Hearth and Crucible STEEL CASTINGS.

QUALITY EQUAL TO STEEL FORGINGS.

Can be Bent, Welded or Forged.

STEEL INGOTS, Best Stock, Furnished to Order.

Ship Patterns direct to Thurlow, Pa., via P. W. & B. R. R., or via P. & R. R. R.

We are prepared to make all kinds of Heavy or Medium Weight

STEEL CASTINGS

FROM

OPEN HEARTH METAL.

We wish to give special attention to making Cast Steel Rolls of all sizes, Mill Gearing wherever Cast Steel is suitable. Also Cranks, Cross Heads, Shafts, &c., for Steam and Blowing Engine construction. Being desirous of securing a share of public patronage, we will endeavor to make our product equal in quality to any in the market.

MACKINTOSH, HEMPHILL & CO., Limited,

PITTSBURGH, PA.

FOR STEEL CASTINGS.

We are licensing Steel Companies for the use of our Silica Molds for Steel Castings. Reference may be had to the Ohio Iron and Steel Co., Cleveland, Ohio; Benj. Aths & Co., Newark, N. J., and the Calumet Iron and Steel Co., Chicago, Ill., who are manufacturing under our patent. For particulars, terms, &c., address

COWING STEEL CASTING CO.,

CLEVELAND, OHIO.

BURGESS STEEL AND IRON WORKS.

MANUFACTURERS OF

CRUCIBLE AND OPEN-HEARTH STEEL,

HOT POLISHED SHAFTING,

Iron and Steel Boiler Plate, Tool, Lay Steel and U. S. Norway Iron, Soft Steel, and Iron Center Cast Plow Steel.

PORTSMOUTH, OHIO.

WROUGHT IRON

Boiler Tubes,

Steam, Gas and Water Pipe.

Oil Well Tubing, Casing and

LINE PIPE.

Cotton Presses, Forgings,

ROLLING MILL AND

General Machinery.

READING IRON WORKS.

261 S. Fourth St., Philadelphia.



FRANKLIN S. MILES, Manufacturer of Brass, Iron, Steel and German Silver SCREWS, 205 Quarry Street, Philadelphia.



BLAIR'S PATENT Hog and Pig Ringers and RINGS.

DAILY PRODUCTION OF RINGS, 75,000.

Parties buying and selling Ringers with two or more grooves in jaw, other than those labeled Blair's Patent, March 17, 1874, are infringing, and will be held responsible for damages.

E. BLAIR,

Bucyrus, Ohio.

JAMES P. WITHEROW,

Succesor to WITHEROW & GORDON, Engineer & Contractor, PITTSBURGH, PA.

Agent for the

WHITWELL HOT BLAST STOVES

OVER 600 IN USE.

The following parties either have them in use or under construction:

Cedar Point Iron Co., N. Y.
Dunbar Furnace Co., Pa.
Crane Iron Co., Pa.
Pennsylvania Steel Co., Pa.
Neshannock Iron Co., Pa.
R. H. Coleman, Lebanon, Pa.
Chester Rolling Mill Co., Pa.
Davenport, Fairbairn & Co., Pa.
Isabella Furnace Co., Pa.
Paxton Furnace, Pa.
Spearman Iron Co., Pa.
Elma Iron Works, Ohio.
Wilton Coal and Iron Co., Ohio.
Winona Furnace Co., Ohio.
Moss & Marshall, Ohio.
H. Campbell & Sons, Ohio.
Hocking Valley Iron Co., Ohio.
Cleveland Rolling Mill Co., Ohio.
Meier Iron Co., Ill.
North Chicago Steel Co., Ill.
Union Iron and Steel Co., Ill.
Keane & Culbertson, Ky.
Ashland Furnace Co., Ky.
Norton Iron Co., Ky.
Southern States C. I. and S. Co., Tenn.
Sewanee Furnace Co., Tenn.
James C. Warner, Rising Fawn, Ga.
Ohio Iron Co., Zanesville, O.
Sloss Furnace Co., Ala.

VARIETY METAL BOOM.

Iron Foundry and Machine Shop.

STEAM HEATING BY DIRECT RADIATION

in all its Branches a Specialty. Brass and other

Metal Moulding, Casting and Finishing. Noiseless

Vertical Engines, Hydrants, Fire Plugs, &c.

FRAS. B. SANNAN,

Pottsville, Schuylkill Co., Pa.

RR CAR WHEELS
CASTINGS OF ALL KINDS
POWELL & Co 9 Winter St CLEVELAND

SILVER & DEMING MFG. CO.,

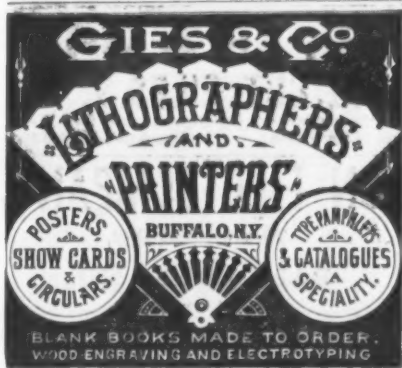
SALEM, OHIO, U. S. A.



MANUFACTURERS OF
Cistern, Pitcher, Well
and Force Pumps,
Wind Mill Pumps,
HAND AND POWER
ROTARY PUMPS,
Hydraulic Rams,
BOILER FEED PUMPS,
Garden Engines, &c.
Also, Carriage Makers' Tools,
Blacksmiths' Drills, Butchers'
Tools, and Feed Cutters.

Write for Catalogue and Prices.

EUROPEAN AGENCY WITH
SELIG, SONNENTHAL & CO.
London, E. C., England.

**JOHN MAXWELL**

Manufacturer of

Patented

BRASS, BRIGHT**TINNED WIRE****& JAPANNED****Bird Cages.**

The cheapest and most

saleable in market.

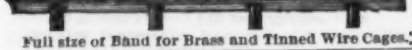
Catalogues and Price

Lists furnished to the

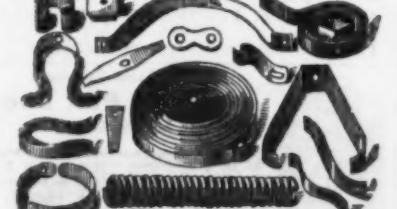
trade.

247 & 249 Pearl St.,

New York.



Full size of Band for Brass and Tinned Wire Cages.

**DUNBAR BROS.,**

Manufacturers of

Clock Springs and Small Springs

of every description, from best Cast Steel.

BRISTOL, CONN.**DETROIT BLOCK**

WORKS,

Detroit, Mich.

MANUFACTURERS OF

EVERY VARIETY OF

Tackle Blocks

AGENTS:

JOHN H. GRAHAM & CO., New

York.

CHAMBERLAIN & MILLER, Chi-

cago.

ST. LOUIS RY SUPPLIES MFG.

CO., St. Louis.

BUFFALO SCALE CO.,

BUFFALO, N. Y.,

Manufacturers of

H. R. Track Scales, Hay Scales, Coal

Scales, Grain Scales, Platform

Scales, Counter Scales, &c.

Send for price list, stating what you want.

2500.

h two o

labeled

ing, and

R,

OW,

DON.

ctor.

L

VES

SE.

in use of

OM.

Shop.

DIATION

and other

Noiseless

Pa.

ELS

AND

AND

AND

AND

AND

AND

AND

AND

AND

AND

AND

AND

AND

AND

AND

AND

AND

W. & B. DOUGLAS,

MIDDLETOWN, CONN.,

The Oldest and Most Extensive Manufacturers of

PUMPS, HYDRAULIC RAMS, GARDEN ENGINES.

Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill

Pumps and other Hydraulic Machines in the World.



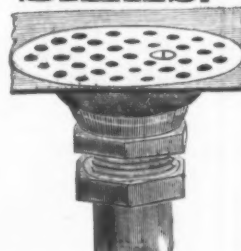
FIG. 126.



FIG. 209.



FIG. 70.

Wrought Steel Sinks.

One of the strong points of these sinks is the new coupling with which they are now supplied and which is pronounced by all plumbers the best on the market. It is used with both lead and wrought-iron pipe; is a neat, reliable coupling, and is easily detached for the purpose of pumping out the pipe. The strainer and all parts of the coupling are turned, and are furnished with all sinks without extra charge.

The fact of the great strength and durability of this sink, as it is practically free from danger of breakage in transportation, handling or use, is a strong point in its favor, and that its merits are recognized by most competent judges is evident from the fact that leading houses which have been interested in the common article have taken up the Wrought Steel Sink. Twenty-five per cent. is saved in freight by purchasing Steel Sinks. Orders come from all parts of the United States, Canada, Europe and Australia.

BRANCH WAREHOUSES:

85 and 87 JOHN STREET, NEW YORK, and 197 LAKE STREET, CHICAGO, ILL.

UNION MANUFACTURING CO.

Manufacturers of

SKINNER'S PATENT COMBINATION CHUCK.

Plain and Ornamental Butts,

Single and Double Acting Spring Hinges,

Union Coil Door Springs,

Galvanized Pump Chain,

Patent Rubber Buckets,

Wooden Well Curbs, Wood Tubing,

Iron and Brass Pumps.

Patent Copper Pumps,

Hydraulic Rams, Power Pumps,

&c., &c., &c.



FIG. 114.

FIG. 114 REPRESENTS OUR

Hand Force Pump.

It is made of brass, is strong and light, and is the best pump of its kind in the market. Write for prices.

UNION MANUFACTURING CO.,

Warehouse, 96 Chambers St., New York. NEW BRITAIN, CONN.

OLD DOMINION**CUT NAILS, BAR IRON.**Address **R. E. BLANKENSHIP,****RICHMOND, VA.**

GEORGE BROOKE, President.

GEO. W. HARRISON, Treasurer.

THE E. & G. BROOKE IRON CO.,

Birdsboro, Berks Co., Pa.,

Manufacturers of

ANCHOR BRAND NAILS AND SPIKES.

Capacity 1000 Kegs per Day.

Made from their own Pig Iron, insuring regularity and superiority in quality.

Also, FOUNDRY AND FORGE

PIG IRON, And Cold Blast Charcoal Car Wheel Iron. IRON AND STEEL DROP FORGINGS

All shapes, small and large, including GUN, PISTOL, WRENCH BARS, &c. ALSO, DIE SINKING. MANUFACTURERS ALSO OF BRICKLAYERS', MOULDERS' AND PLASTERERS' TOOLS, SADDLERS' ROUND AND HEAD KNIVES.

WILLIAM ROSE & BROS.,

36th & Filbert Sts., WEST PHILADELPHIA.

NATIONAL HARDWARE & MALLEABLE IRON WORKS,

Lehigh Avenue, American and Third Streets, Philadelphia.

THOMAS DEVLIN & CO.,

MALLEABLE, FINE GRAY IRON AND STEEL CASTINGS made from patterns to order. Special attention given to Tinning, Bronzing, Coppering, Japanning and Fitting. A large line of Carriage and Wagon Castings constantly on hand for the trade.

BRIDGEWATER IRON CO., Bridgewater, Mass.

Manufacturers of

SEAMLESS DRAWN BRASS & COPPER TUBES, CUT NAILS, HORSE NAILS, FORGINGS, &c.**NAHUM STETSON Jr., Agent, 73 Pearl Street, New York.**

24 feet long by 7 feet in diameter, which are heated by waste gases from the heating furnaces. They have two flues 2 feet 6 inches in diameter, one furnace delivering into each flue. There are also 15 coal-fired boilers of a similar type. From these mills we pass back to the offices, and have completed the round of the Ebbw Vale Company's extensive works.

A few figures relating to the extent and production of the various branches of the company have been prepared for the information of the members of the Institution of Mechanical Engineers, and from these we reprint the following data:

Mineral Properties.			
	Freehold	Acres.	Total.
Ebbw Vale.....	2,800		
Ebbw Vale.....	2,800		
Aberystwyth.....	60		5,000
Aberystwyth.....	1,750		
Pontypool.....	330		1,810
Aberystwyth.....	1,800		2,500
			1,620
			10,330

Collieries.			
	Tons.	Output in 1883.	
Ebbw Vale.....	354,300		
Sirhowy.....	247,195		
Victoria.....	185,644		
Waunilwyd.....	258,154		
			1,035,292
Aberystwyth.....			256,215
Pontypool.....			174,604
Total.....			1,486,021

Coke made 1883.

	Tons.
Ebbw Vale.....	203,097
Pontypool.....	37,233
Aberystwyth.....	33,032
Total.....	273,362

The entire coking plant is equal to a production of 340,000 tons per annum.

Bricks made 1883.

	No.
Ebbw Vale.....	5,433,644
Aberystwyth.....	524,075
Total.....	5,957,719

Iron and Steel Works.—Production 1883.

	Tons.
Ebbw Vale.....	161,313
Pontypool.....	24,984
Aberystwyth.....	26,115
Total.....	212,412

Finished Iron and Steel.

	Tons.
Ebbw Vale.....	11,120
Steel rails, bars and fish.....	115,572
Pontypool.....	4,088
Coke, bars, sheets, &c.....	4,088
Total.....	131,790

Castings made.

	Tons.
Ebbw Vale foundries.....	10,997
Pontypool.....	581
Total.....	11,578

Manufactures in Indianapolis.

The following article from the Indianapolis Times is interesting as showing the progress of manufactures in that city, and the rapid building up by ingenious machinery of an industry that but a few years ago had no existence:

The manufacturing industries of Indianapolis have grown so quietly and unostentatiously that few citizens have any idea of their extent or variety. Even among newspaper men the ignorance upon this question is surprising. A few days ago the freight agents of the various railroads met and made a special freight rate on kraut cutters. One of the papers of the city regarded this as a joke and so stated, adding that there were not a dozen kraut cutters shipped from this point in a year, while the truth is that one firm alone manufactures and ship them by the carload. This statement will be news, no doubt, to nearly every citizen of Indianapolis. Yet it is true that large numbers of such cutters are manufactured in this city per year. To show how the manufacturing industries of Indianapolis have grown, the Times proposes to give a brief sketch of one establishment. In 1863, in a little shed about 12 x 18 feet in size, W. H. Tucker began the manufacture of money drawers in this city. The work was all done by hand, and but few could be made per week. In fact, but few could be sold, the demand being very limited, confined exclusively to Indianapolis and a few neighboring villages.

The outlook was discouraging, but Mr. Tucker believed not only in the future of Indianapolis, but in the future of his patent safety money drawer, and worked on. When he would get a few drawers ahead he would start out and visit the towns around Indianapolis, widening the circle each year and extending his trade. He looked forward to a time when the demand for his manufactures would be so increased that machinery would have to be employed in their make, but his wildest dreams did not reach forward and see in the future a time when his trade would reach to every civilized part of the globe, and that machinery would be used by which one man would be able to do more work in one day than he formerly did in 10; yet all that has been realized in the small space of 16 years. From that short beginning has sprung the great establishment of the Tucker & Dorsey Manufacturing Company, with their sales of 20,000 money drawers a year. But it may be asked, Where do all these tills go? Sale is found for them in every State in this Union, and in almost every city. They are shipped to Canada, to Venezuela, Australia, France, Switzerland, Mexico, Germany, Portugal, Korea, and even to China.

The process of manufacture is an interesting study. To meet the demand new and improved machinery has had to be invented and constructed. To cut the sides and bottoms so that as little waste of material as possible should result, a saw is made that in its passage through the lumber cuts out so small a portion that the eye can hardly detect where it has passed through, and its work is as rapid as it is invisible. The machine for dovetailing and fitting the parts together is as ingenious a machine as was ever put up. By it four pieces are dovetailed at once, and so perfectly is the work done that any two may be taken out of thousands of pieces, and they fit as closely as if one was made for the other. Formerly this dovetailing and fitting was all done by hand, and 75 was counted a good week's work. Now a man thinks nothing of 120 a day. Another ingenious machine is the one which hollows out the cups for the reception of coin. Six of these cups are made for each

drawer, and they are made almost in the twinkling of an eye, and so finished that no sand paper is needed to polish them. The bottoms and sides of the drawers are made of red gum, the coin cups of cherry, walnut or sycamore. When completed the drawers are taken to the storeroom and there packed for shipping. They are neatly packed in cases containing half a dozen. This alarm till is the best in use. It is as easily opened as a common drawer, but will sound the alarm promptly if tampered with. The combination is susceptible of 32 changes, and can be changed in a second. No key is needed. Besides the cups for coin, places are arranged for keeping bills according to their denomination. They are not only valuable for preventing tampering, but for making change, as each denomination of coin or paper is kept separate, and mistakes are thus avoided.

But money drawers are not the only things manufactured in this establishment. They manufacture what is known as the "Hoosier" saw buck. This is a complete folding saw buck, made of hardwood, with malleable iron locks; towel rollers of walnut and cherry, with back and shelf; maple potato mashers, maple steak mauls, maple rolling pins, base-ball bats, wood-saw frames, all made and sold by the thousands, and each is a perfect thing of its kind, all turned out by rapidly-revolving machinery. They have lately added to their wares the "Daisy" wrought-iron adjustable stove truck. This is so constructed that it is readily arranged to fit any size of stove. With it the heaviest stove can be moved with but little labor. Every piece of iron is thoroughly tested before it is used, and such a thing as breakage after the truck is put together is unknown. There remains one other branch of this establishment to be noticed—the saw and kraut cutters. In this branch 25 carloads of cherry lumber will be used this year. The cutters are of various sizes, from the little vegetable cutter, 6 inches long, to the mammoth kraut cutter, 12 x 40 inches in size, and with four knives. All these are made of well seasoned cherry wood, and the knives are easily adjustable so as to cut any required thickness. This is a new industry, but has already reached large proportions, the cutters being shipped by the carload. In fact, the establishment has not been able to accumulate a stock, the demand being ahead of the capacity of supply. To get cherry for the use of the establishment the country over is scoured. Three hundred thousand pounds of small castings are annually used.

The establishment where this work is done is a model in many respects. It is a large three-story brick building, constructed with an eye not only to rapid and economical turning out of work, but to the health and convenience of the workmen. Mr. Tucker long ago recognized that a proper care for the convenience and health of his employees was not only a duty of humanity, but amply paid in the better work secured. With this object in view, he has introduced into his establishment all the conveniences possible. The workrooms are large and excellently ventilated. The dust that arises from the numberless saws and planers is all driven away before it reaches the lungs of the workmen. Fresh air is abundantly supplied, and ample arrangements are made for heating in winter. To move the heavy loads of lumber, and have them convenient to the workmen, trucks are used. There is no straining of arms or backs in lifting or moving heavy loads, but every care is taken that the men shall have every facility for doing their work with ease. In the early stages of his business life Mr. Tucker adopted as his rule of action to put no goods on the market that were not equal in every respect with the best. To this rule the establishment has rigidly adhered, and it has been one of the secrets of the great success with which it has met, and so well established is the reputation of the Tucker & Dorsey Manufacturing Company than when a dealer orders from them he feels assured that his order will be filled with goods of the best quality, both as to the material used and to the workmanship.

Bessemer Steel Supplanting Other Kinds.—We take from the Sheffield Telegraph the following description of the inevitable conflict foreshadowed when Bessemer completed his remarkable process: "The competition between the Bessemer steel makers and the manufacturers of crucible steel is becoming increasingly severe. Rapid advances are being made in the quality of the Bessemer metal. This is amply illustrated by what is now going on at the colossal establishment at Barrow-in-Furness of the Barrow Hematite Steel Company, Limited. In addition to an extensive output of rails, fish plates, railway tires and axles, square, round and flat bars, hard and soft steel blooms and billets, suitable for steel and tinplate making, &c., and such like heavy production, the company are regularly making upward of 1000 tons per week of 'special' steel, for purposes for which only Swedish Bessemer, charcoal and best scrap iron were formerly considered suitable. This special steel is being worked up in various parts of the Kingdom into roll-turning and lathe-turning tools, chisels, files, shear blades, rail drills, rail punches, shear steel for welding to iron, miners' drills and tools, picks, shovels, hand hammers, roller, bar and cotton spindles, locomotive engine, wagon, carriage, coach and furniture springs, bolts, nuts, rivets, pit ropes, telegraph, crinoline and corset wire, umbrella frames, wire for musical instruments, &c. Indeed, the steel is suitable for the manufacture of cutlery and razors, and is to some extent being used for these purposes also. A test of the quality of soft steel as manufactured for pit chains is afforded in the circumstance that a 1-inch chain has, under test, withstood a breaking load of 35.63 tons; elongation 6 or 18 inches."

A tiny steamer, brought across the Atlantic in a big one and towed through the St. Lawrence River and the lakes, is finally to be carried by men 40 miles overland to Lake Pond d'Oreille, which is close to the northern boundary line of Idaho. She is owned by Englishmen who have bought a tract of land there.

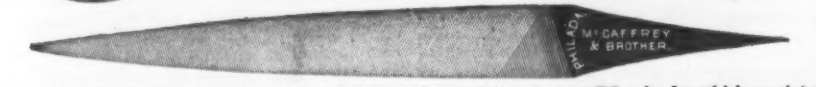
Paris, 1878.

For Superiority.

McCAFFREY & BRO.,

PENNSYLVANIA FILE WORKS

Philadelphia, Pa., U. S.



Manufacture and keep in stock a full line of FILES and RASPS only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.

Superiority acknowledged wherever used, sold or exhibited.

THE ATTENTION OF THE TRADE

IS AGAIN CALLED TO THE

UNIVERSAL CORN HUSKER

As being the MOST DESIRABLE
and ONLY

PERFECT HAND CORN HUSKER

Now in the Market. As a "Selling Commodity" it meets the Demands of the Most
Exacting Trade; and as an Article of Practical Utility, the Wants of All Users.

MADE ENTIRELY OF BRASS,

Without LEATHER STRAPS, LOOSE RINGS, WEB OR SET SCREWS to wear out and render it useless.

ONLY ONE SIZE, which, by an Adjustable Feature, will fit any Hand. This is of Importance
to the Retailer, as there are no Extreme or Odd Sizes which are unsaleable.
This season a proper proportion of Left-Hand Huskers will be packed in each Quarter-Gross.

Prices and Discounts upon Application. Jobbing Trade Supplied by

JOHN H. GRAHAM & CO.,

SOLE MANUFACTURERS' AGENTS,

113 Chambers Street, - - - NEW YORK CITY.

LIGHTNING HAY KNIVES. WEYMOUTH'S PATENT.

This knife is the best in use for cutting down hay and straw in mow
and stack, cutting fine feed from bales, cutting corn stalks for feed, cut-
ting pest and ditching marshes.

The blade is best cast steel, spring temper, easily sharpened, and
giving universal satisfaction. A few moments' trial will show its merits,
and parties once using it are unwilling to do without it. Its sales are
fast increasing for export as well as home trade, and it seems destined
to take the place of all other Hay Knives.

They are nicely packed in boxes, one dozen each of 50 pounds
weight, suitable for shipping by land or water to any part of the world.

MANUFACTURED ONLY BY

HIRAM HOLT & CO., East Wilton, Franklin Co., Maine.
For sale by the Hardware trade generally.

CAUTION

We are informed that various parties are infringing upon the
widely-known Letters Patent granted originally to George F. Weymouth,
for an improved Hay knife.

The characteristic feature of the invention is a curved blade, pro-
vided with saw-tooth cutters, and furnished with suitable working han-
dles. It is our purpose to prosecute all infringers of our patent, and we
have already commenced one suit, which is nearly ready for hearing, and
are about commencing suits against other parties.

All manufacturers are hereby warned of our rights, and the public
are cautioned against purchasing any Hay "Saw Knives" which are
not of our genuine manufacture.

HIRAM HOLT & CO.

EAST WILTON, May 26, 1884.

J. M. STUTZMAN,

181 William Street, NEW YORK.

Steel Alphabets,

Die Letters for Seal Engravers.

BRANDS, SEALS,**POSTMARKERS,**

Door Plates.

Steel Stencil-Cutting Dies, Soap Moulds and Brass Stamps.

SEND FOR PRICE LIST.

West Side Galvanizing Works.

JOHN MERRY,Manufacturer and Sole Proprietor of the
above well-known Brands of**GALVANIZED SHEET IRON**

desire to caution my friends and the public against purchasing, selling or using any galvanized iron
purporting to be of above brands, and being offered by my late partner, E. T. Hoopes, the same being an
infringement of my rights and trade-marks, suit having been commenced by me against him for such in-
fringement, and damages arising therefrom. Also that from this date my galvanized iron will have the
words "BEST BLOOM" under the "LION" Brand and "CHARCOAL" under the "PHOENIX" Brand.

Office and Works, 535 to 547 W. 15th St., New York City.

GARRY IRON ROOFING COMPANYLargest manufacturers of Iron
Roofing in the world. Manu-
facturers of all kinds of**IRON ROOFING**Crimped and Corrugated Siding,
Iron Tile or Shingles,
Fire-Proof Doors, Shutters, &c.**IRON ORE PAINT****AND CEMENT.**153-155 MERWIN STREET
CLEVELAND, O.Send for Circular and Price
List No. 15.**TACKS AND WIRE NAILS.**

Swedish Iron Upholsterers' Gimp, Lace and Card Tacks. Black and Tinned Trunk and Clout Nails.

Finishing Nails and Brads; Shoe Nails of Swedes and Common Iron; Copper, Brass & Steel

Lining and Saddle Nails; Tufting Nails and Tufting Buttons; Brass and Steel Wire

Nails, Molding Nails, Escutcheon Pins, Black and Galvanized

Regular and Chisel Pointed Boat Nails.

New York Salesroom, 116 Chambers Street,

AMERICAN TACK CO., Fairhaven, Mass.**Nicholson
FILES.**

Bandsaw Files,
Boot Heel,
Brass,
Cabinet,
Cant,
Cotter Taper,
Cotter Equaling,
Cross or Crossing,
Doctor,
Drill,
Feather Edge,
Finishing,
Flat,
Flat Equaling,
Flat Wood,
Gang-Edger,
Ginsaw,
Gulletting,
Half-Round,
Half-Round Wood,
Hand,
Hand Equaling,
Handsaw Blunt,
Handsaw (Double-End),
Handsaw Taper, single-cut,
Handsaw Taper, double-cut,
Handsaw Taper, slim,
High Back,
Hook-Tooth,
Knife,
Knife Blunt,
Lead Float,
Lightning,
Machine Mill,
Mill,
Mill Blunt,
Mill Pointing,
Pillar,
Pitsaw,
Reaper,
Roller,
Round,
Round Blunt,
Slotting,
Slim Handsaw Taper,
Square,
Square Blunt,
Square Equaling Files,
Stave Saw,
Three-Square Files,
Three-Square Blunt Files,
Tumbler Files,
Union Cut,
Warding Files,
Warding Blunt File,
Warding Round Edge File.

RASPS.

Baker's
Beveled Edge,
Bread,
Cabinet,
File, Flat and Half-Round,
Flat Shoe,
Flat Wood,
Half-Round Shoe,
Half-Round Wood,
Horse, Plain and Tanged,
Horse Mouth,
Jig,
Oval or French Shoe,
Racer, Plain and Tanged.

SPECIALTIES.

Butchers' Steels, Improved,
Bent Riffles, Handled,
File Cards,
File Brushes,
Machinists' Scrapers,
Stub Files & Holder, Detach-
able,
Surface File Holder,
Vise File Holder.

**NICHOLSON
FILE CO.,**PROVIDENCE,
R. I.,

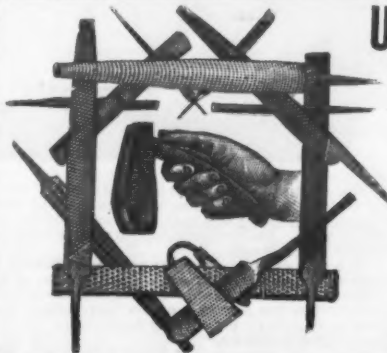
SOLE MANUFACTURERS.

BLACK DIAMOND FILE WORKS.

G. & H. Barnett, 21 to 43 Richmond St., Philadelphia.

CHARLES B. PAUL,
Manufacturer of HAND CUT FILES.

Warranted **CAST STEEL.** 157 Tenth Street, Williamsburg, New York
All descriptions of Files made to order. Price List mailed on application. Established 1863.

**UNION FILE COMPANY,**

309 to 315 North Street,

BALTIMORE, MD.,

Manufacturers of

FILES AND RASPS

Made from the Best Refined Cast Steel.

In offering our goods we guarantee to give
satisfaction, each File being thoroughly examined
at every stage of manufacture and tested by an
expert before leaving the works.
We are continually increasing our facilities and
are prepared to fill orders promptly.

THRIFT FILE WORKS,
Manufacturers of all kinds of
Files, Rasps.**CHRISTIAN HENSSELER,**
448, 450, 452 & 454 Ireland St., PHILA., PA.
HERRING & SWEASEY, Agents in New York, 102 Chambers St.**GUN POWDER.****Laflin & Rand Powder Co.,**

No. 20 Murray Street, New York,

Manufacture and sell the following celebrated brands
of Sporting Powder known everywhere as**ORANGE LIGHTNING,****ORANGE DUCKING,****ORANGE RIFLE,**

more popular than any Powder now in use.

Blasting Powder and Electrical Blasting**Apparatus.****Military Powder** on hand and made to order.**SAFETY FUSE, FRICTIONAL & PLATINUM****FUSES.**

Pamphlets showing sizes of grain sent free.

The Patent Combined

Dinner Pail and**Lantern.**The most perfect Dinner Pail
in the world. Hot coffee for
dinner and a Lantern at night.

Manufactured by J. H. HAIGHT,

PORT CHESTER, N. Y.

Sent by express on receipt

of \$1.00. Agents wanted.

HELLER & BROS., NEWARK, N. J.

Manufacturers of the

**CELEBRATED AMERICAN HORSE RASPS FILES AND
FARRIERS' TOOLS.**

Made of solid best CLAY CRUCIBLE CAST STEEL of our own manufacture and
warranted to be unequalled in the market. For sale by Iron and Hardware dealers
throughout the United States and Canada.

**J. M. KING & CO.**

WATERFORD, N. Y.,

Manufacturers of the **BUTTONS PATENT****"WIRE CUTTER AND PLIER COMBINED."**

Specially Adapted for Use on Wire Fence.

Also Manufacturers of

Blacksmith and Machinists' Stocks and Dies, Plug and Taper Taps**Hand, Nut and Screw Taps, Pipe Taps and Reamers.**

Price List on Application. Established by DANIEL B. KING, 1859.

LIGGETT SPRING AND AXLE CO.,

LIMITED, MANUFACTURERS OF

SPRINGS AND AXLES

For Coaches, Phaetons, Buggies, Wagons, &c.

Pittsburgh, Pa.

T. H. BULLOCK,**BELLOWS AND FORGE**

Manufacturer,

85 & 87 Columbus St.

CLEVELAND,

OHIO



IRON-CLAD ICE BALANCE.

JOHN CHATILLON & SONS, NEW YORK,

91 & 93 Cliff Street, NEW YORK.

MANUFACTURERS OF
Spring Balances, Patent Balances, Union and
Counter Scales, Spiral Springs.

Send for Illustrated Price List.

WILDE'S PATENT
Expanding Mandrel

IS THE MOST PERFECT NOVELTY OUT.

Simple, Inexpensive, Accurate.



COOKE & CO.,
22 Cortlandt Street, NEW YORK.

Sales Agents and Dealers in
GENERAL MACHINERY AND SUPPLIES
FOR
Manufacturers, Mills, Mines, Railroads
and Steamships.
Engines, Rollers, Pumps, Blowers, &c.
Write for circular and mention this paper.

AN IMPROVED
LEVELING INSTRUMENT.



PRICE OF INSTRUMENT COMPLETE, \$20.

Adapted to the Use of Architects, Engineers, Masons,
Builders, Farmers and Others.

This instrument is made of Brass and Iron, fur-
nished with both masons' (short metal) and survey-
ors' tripod, and put up in a handsome wooden box,
with strap. The only low-priced level that can be
thoroughly adjusted in the field.

A NEW LEVELING ROD.

This rod is round and made in two sections; it
is united by a solid screw joint, as if of one length,
and has a target. There are two scales, one side being
Engineers' (feet, inches and eighths), the other Archi-
tects' scale (or, feet, inches and eighths). Price, \$6.

W. M. T. COMSTOCK, Manufacturer,
6 Astor Place, New York.

Circulars and discount to hardware trade furnished
to dealers sending their card.



Barnes' Pat. Upright Drills.
20-Inch Swing, with both
Worm and Lever Feed.

Barnes' Patent Engine Lathe
15-inch swing, 6-foot or 8-foot
Bed. These machines are made
specialty in our factory; they have
advantages not found in other
machines in this line. It will pay
parties desiring to purchase, or
know more about this class of
machines, to send for full description
and prices.

W. F. & JOHN BARNES,
19 Ruby St., Rockford, Ill.

P. W. Gallaudet

Cor. Broadway and Nassau St., New York.
Bankers and Dealers in **COMMERCIAL PAPER.**
Stocks and Bonds dealt in for cash or on margin at
New York Stock Exchange.

GEORGE W. BRUCE,
1 Platt St., New York, Proprietor of the
ATLANTIC SCREW WORKS.

Agent for the
Florence Tack Co. and
C. A. Maynard.

MAYNARD'S C. & S. Planters'
Hilling, Bog and Handled
Planters, Cotton and Field
Rolls.

BRADY'S Crown, Planter's
and Hilling.

ELWELL'S Weeding, Planter's
and Grub, and a variety
of other kinds for Home
and Export Trade.

ESTERBROOK'S STEEL
PENS

Leading Numbers: 14, 048, 130, 333, 161.
For Sale by all Stationers.

THE ESTERBROOK STEEL PEN CO.
Works, Camden, N. J. 24 John St., New York.

ESTABLISHED 1843.
MORE THAN 200 DIFFERENT PATTERNS.

None Genuine without our Trade-Mark.

EAGLE and "FISHER" Stamp.



WARRANTED BETTER THAN THE BEST ENGLISH ANVIL!

Face in one piece of **BEST TOOL CAST STEEL, PERFECTLY WELDED**, perfectly
true, of hardest temper, and never to come off or "settle." Horn of tough untempered
steel, never to break or bend. Only Anvil made in United States fully warranted as
above.

FISHER DOUBLE-SCREW VISE

IS FULLY WARRANTED STRONGER THAN ANY OTHER LEG VISE, AND
ALWAYS PARALLEL. Is the best Vise for Machine Shops and Blacksmiths, and for
all heavy work. **ACCURATE AND DURABLE.** Send for Circular.

EAGLE ANVIL WORKS,
TRENTON, N. J.

RICHARD DUDGEON,

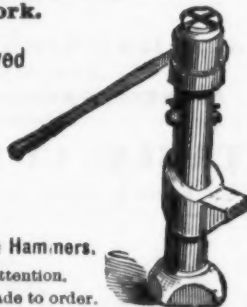
No. 24 Columbia Street, New York.

Maker and Patentee of the Improved

Hydraulic Jacks

AND

Punches.



Roller Tube Expanders and Direct Acting Steam Hammers.

Communications by letter will receive prompt attention.
Jacks for pressing on Car Wheels or Crank Pins made to order.

ANSONIA BRASS AND COPPER CO.,
MANUFACTURERS OF
PURE ELECTRIC WIRE,

For Magnets, Telegraphs, Telephones, &c.

Insulated on the bare wire with H. Splittorf's patented Liquid Insulation, covered with cotton or silk.

All sizes of Bare and Covered Wire in Stock.

The conductivity of every bundle tested and warranted.

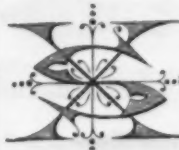
THE ANSONIA WROUGHT GONGS,
For Clocks, Indicators, Telephones, Call Bells, Bell Patches, Steamboat and
Railroad Use. Burnished or Nickel Plated.

ANSONIA BRASS AND COPPER CO., 19 Cliff St., New York.

THE ESSEX HORSE NAIL CO., LIMITED,

OFFICES:

ESSEX, ESSEX CO., NEW YORK,
100 Chambers St., NEW YORK CITY.



The Essex Horse Nails

Are drawn from the best Swedes Iron Rods only. They are hot forged and cold-pointed,
rendering them tough, stiff and easy driving, and are warranted

FIRST-CLASS IN EVERY RESPECT.

All Nails branded "ESSEX" are Fully Guaranteed.

Stanley Rule & Level Co.,

MANUFACTURERS OF

Improved
Carpenters'
Tools.



FACTORIES,
New Britain, Conn.

WAREHOUSES,
29 Chambers St.,
New York.

Manufacturers of **Halley's Patent Adjustable Planes.**
General Agents for the sale of **Leonard Halley & Co.'s "Victor Planes."**
Manufacturers of **"Defiance" Patent Adjustable Planes.**

MALIN & CO., CLEVELAND, OHIO.

Dealers in Steel, Copper, Brass, Tin Plated and Copper Plated Wire,
Manufacturers of **BESSMER STEEL WASHERS.**

PATENT SPOOL WIRE FOR THE RETAIL HARDWARE TRADE.

Dealers who handle it do away with the **Broken Bundle Business** and sell small quanti-
ties by the spool only. It is a convenience for both dealer and consumer. It is **Patent-Coated**
and **cannot rust**; it is wound
like spool cotton on a **Warier**
Pound, Half Pound and
One Pound Spools, one
dozen spools in a box.
Our spooled **Wire** is
the best in the market.

FOR SALE TO THE TRADE BY

MALIN & CO.,

CLEVELAND, O.,

AND BY

Hardware Jobbers Everywhere.

SEND FOR ILLUSTRATED PRICE LIST.

SPECIAL WIRES FOR MANUFACTURING PURPOSES ON ANY SIZE OF SPOOL.

JOHN WALES & CO.,

Eastern Agents.

239 and 241 Franklin St.,
BOSTON, MASS.



New Inventions.

A self-lubricating wheel that works loose
on axles and shafts has been invented by
W. T. Snyder, of Catasauqua, Pa. The hub
is constructed somewhat larger than usual
and within it is formed a chamber of the
shape of the figure 8. This chamber is con-
structed with break walls and opens into the
hole of the wheel. When the wheel revolves
it gives motion to the oil within the cham-
ber, throwing it from the center. The oil
will come in contact with the break walls,
which will force it against the axle, thereby
keeping the latter lubricated under all
speeds.

C. W. H. Day, of Attleborough, Mass., is
the patentee of a machine for winding flat
or odd-shaped wire, for the purpose of mak-
ing links for chains and other articles.
Heretofore the coils have been wound upon
a long arbor and drawn from the arbor after
being completed. This process was laborious
and frequently produced coils that formed
imperfect links when cut. The inventor
employs a revolving arbor having a shoulder
near one end. A friction clamp gives proper
tension to the wire which is wound on the
arbor. A clearer pushes the wire coils off
from the face as fast as they are formed.
The clearer bears with one side against the
shoulder of the arbor, and with the other
against the wire, so that it cannot move later-
ally. The claim of the patent covers the
combination of an arbor with a clearer and
a tension device, and with means for revolving
the arbor.

A holder for barb wire, by which a coil of
wire may be easily transported from place
to place, has been patented by W. P. Stewart,
of Natchez, Miss. It consists of two
grappling hooks, bent first upwardly and
then crossing one another over the wire
spool. At the crossing the hooks are pro-
vided with a series of perforations for the
insertion of a pivot-pin. By introducing the
pin into different holes the spread of the
hooks may be decreased or diminished. At
the engaging ends the hooks have spindles
that enter and loosely fit within sockets of
the spool, which revolves on the spindles.

A journal brass patented by S. A.
Bemis, of Springfield, Mass., is provided at
each side of the bearing surface with a
curved pending wing that terminates at the
ends of the brass. The inside of each wing
is cut away or chambered, the chamber
being deepest opposite the central part of
the brass, while it is quite shallow at the
ends. By this construction the inner faces
of the wings are held out of contact with
the journal, and do not interfere with the
oil flow. The oil flows from the ends of the
brass along the edges of the wings to their
lowest points, from whence it drops into a
proper receptacle in the axle-box.

A furnace for steam boilers and general
heating purposes, recently invented by O.
Wilson, of Cleveland, Ohio, is provided with
a backwardly and downwardly slanting re-
verberatory arch which forms a throat
extending from the fireplace into the com-
bustion chamber, beyond and under the
boiler. The arch is made of bricks laid in
the form of checker-work, to leave air pas-
sages. In the side walls of the furnace are
made flues that open from the ash-pit and
connect at their top with the air passages in
the arch. As the arch becomes heated, a
strong draft of air is created in the flues,
and the air, highly heated, is discharged at
the throat. In this way hot air is fed to the
throat for consuming the gases and smoke
from the first combustion of the fuel.

An oiler for car axles has been brought
out by J. Gibbons, of West Troy, and G. R.
Meneely, of Albany, N. Y. A two-part
frame is made to hold a wick, the ends of
which are adapted to be immersed in oil con-
tained in the bottom of the journal-box.
The parts of the frame are hinged together
on one of the edges, and provided with an
intermediately-placed spring which forces
the upper part of the frame and the wick up
under the car axle. The device can be
applied to the ordinary axle-boxes without
their reconstruction.

A detachable handle for picks, axes,
hatchets, &c., patented by J. H. & C. Cook,
of Drifton, Pa., is surrounded at its end by
a ferrule having longitudinal ribs at oppo-
site sides. These ribs are of dovetailed
form, in cross-section, and increase in height
toward the end of the handle. They fit into
corresponding grooves formed in the pick
eye. The pick is slipped over the handle,
and as the ribs engage the grooves the parts
will be tightly locked in place. A few taps
will disengage the handle, if desired.

T. Cooke, of Philadelphia, Pa., is the pa-
tentee of a damper regulator in which the
pressure of steam raises a weighted valve
and then bears upon a column of water,
which operates the mechanism connected to
the damper. Thus the steam, whenever it
exceeds the regulated pressure, shuts off the
draft, and when it falls below the desired
pressure it opens the damper and causes a
full draft. The valve is weighted and moves
vertically within a chamber that communi-
cates at its bottom with the water recep-
tacle. This receptacle has two upwardly-
extending arms, both of which are filled
with water. The water in one arm is sub-
jected to the steam pressure, while the other
arm carries the float that regulates the
damper. As the water in the first arm is
pressed down more or less by the steam, the
water in the other arm is raised correspond-
ingly to properly operate the damper.

Means for supporting and anchoring dry
sand and other cures in molds for casting
hollow forms have been invented by L. C.
Rodier, of Detroit, Mich. The chaplets are
constructed of wire, and are made with in-
dentations near the head, while a bend or
nick is formed near the foot. After the pat-
tern is secured in the flask the molder in-
serts the head of the chaplet from below
into a hole of the pattern. Then by a radial
movement he carries its foot into a recess of
the cross-bar, and after this is done the flask
is rammed up in the manner usual with a
two-part flask. As the chaplets are put in
place before the mold is finished, all gaus-
ing is avoided and more uniform work pro-
duced.

An apparatus for pulverizing small pieces
of ore into fine dust has been devised by
J. Nicholas, of Illogan, England. The ore is
put into a hopper, and, by means of water,
conducted through apertures upon a barrel

or rubbing device. This barrel is made of
inclined planes bent into cylindrical form,
and so placed that the larger end of each
plane is next to the lesser end of the plane
following. By the action of the barrel the
ore is ground or pressed between each in-
clined plane and the bottom of the machine.
A groove formed by the junction of the
greater and lesser ends of the inclined
planes will allow a space for the material to
change position, and on the next contact it
will receive pressure on another surface.
The material, when ground to sufficient fine-
ness, is carried out of the apparatus by the
escape of water through an opening pro-
vided for that purpose.

For the purpose of oiling the wire before
it is put through the barbing machine, a
device has been brought out by J. Stubbe,
of Pittsburgh, Pa. It consists of a tubular
shell with contracted openings at each end
for the reception of the wire. Within the
shell there are arranged two perforated cyl-
inders, open at each end, and of different
diameters, so that one may be conveniently
slipped over the other. Cotton wicking or
other fibrous material is placed in the inner
cylinder and doubled up over one of its
edges, and then the outer cylinder is slipped
over it. This will lock the fibers well in
place and prevent them from being pulled
out by the wire as the latter is drawn
through the apparatus. The oil cup is
placed on the upper side of the shell
and saturates the fibers through the
holes in the cylinders. The device, it is
claimed, greatly economizes the oil, prevents
drippings and coats the wire evenly.

A machine for washing and concentrating
all classes of ores has been invented by J. C.
Wiswell, of West Medford, Mass. It con-
sists of a tank composed of two metal cyl-
inders arranged one within the other, with a
water space between them. Within the
inner cylinder vertical rods are arranged
which are attached to the cover of the cyl-
inder. This cover is supported upon a spindle,
so as to be rotated with the rods. To the
rods are secured inclined slats which, when
rotated, force the water and refuse particles
to the top of the tank, where they are dis-
charged into a spout. The cleaned ore is
discharged at the bottom. To the bottom of
the tank is fastened a perforated water-
supply tube. The lower portions of the sides
of the inner cylinder are also perforated.
When the machine is in operation water is
forced through these perforations toward
the center, and also through the perforated
central pipe toward the circumference. These
opposing jets thus meeting at any
desired pressure, cause the ore, it is claimed,
to be thoroughly and rapidly cleaned.

A furnace of novel construction has been
invented by M. A. Foster, of St. Louis, Mo.
The sides of the fire chamber are made with
slanting walls projecting toward the grate.
An arch spans the fire from side to side and
extends the whole length of the grate-bars.
A passage for the products of combustion is
left between the rear edge of the arch and
the bridge wall. The arch has also apertures
for the upward passage of the products of
combustion from the fire chamber to the
boiler. Heating coils are placed in a pit
between the bridge wall and a secondary
bridge wall. A part of the products of com-
bustion passes over the bridge walls, while
part of the gases pass through openings ex-
tending through the bridge wall to the bot-
tom of the pit. From there they may pass
either over the second bridge wall or across
the bottom of the pit through passages in
such bridge wall.

A new compound for welding iron and
steel is made up of the following elements:
Four pounds of borax, 1 pound of white-
marble dust, 1 ounce of steel filings, 2 ounces
of charcoal, 1/2 ounce of saltpeter and 1
ounce of pulverized prussiate of potash.
These ingredients are pulverized and then
mixed, so that all the elements become thor-
oughly compounded. This mixture has been
patented by J. S. Wilkins, of Cincinnati,
Ohio.

J. Kinzer, of Pittsburgh, Pa., has invented
a pin for venting cores, which also provides
for the proper anchoring and strengthening
of the core. The core-pin consists of a
tapering, nail-like body, the larger end of
which is spread on two sides to form the
head, while the smaller end is pointed.
Tapering longitudinal grooves are formed in
both sides of the body, which are deepest at
the head portion of the pin. The edges of
the body are beveled toward each side, and
the beveled surfaces are provided with
transverse serrations. The vent-former con-
sists of a piece of wire bent into staple
shape and strengthened at its upper closed
end by a body of metal which is cast in
between and on to the arms of the vent for-
mer. The core-pin and vent-former are
first thrust into the core until the lower end
of the pin nearly reaches the end of the core.
The main body of the mold is then formed
around the head of the core-pin and the
upper end of the vent-former. After the
main portion of the mold is formed, the vent-
former is withdrawn to leave a vent passage
which communicates with the passage
formed in the main body of the mold above
the core-pin.

A New Lake Revenue Cutter.—The
Commodore Perry, a United States cutter,
just completed by the Union Dry Dock
Company, of Buffalo, for service on the
Great Lakes, is an iron steamer of 451
tons displacement. Her length over all is
161 feet, on the water line 145 feet, beam
25 feet, depth 11 feet 2 inches, draft of
water 9 feet. Her rig is that of a topsail
schooner. Her engines and boiler were con-
structed by the Hartford Engineering Com-
pany. The boiler is a return tubular, 15 feet
long and 11 feet 6 inches diameter of shell.
She has a single direct-acting engine, cylin-
der 38 inches diameter and 40-inch stroke,
single screw propeller 10 feet in diameter
and of four blades. Her decks and spars are
of white pine. All hands, from the captain
down, are quartered below the main deck;
the captain's cabin is in the extreme stern
next the ward room. The engine and boiler
are amidships and the men forward. The
woods used for finishing are white pine, black
walnut, mahogany, cherry and ash. She is
a neat, handsome little steamer inside and
out, in every way creditable to the builders.
An excellent drawing of the vessel has been
made by Mr. Frank R. Rosseel, of Buffalo.

INFRINGEMENT OF JOHN WILSON'S TRADE MARK, MASSACHUSETTS, U.S.A.

JOHN WILSON'S
BUTCHERS' KNIVES,
BUTCHERS' STEELS,
and
SHOE KNIVES.
—
TRADE MARK



REGISTERED IN ENGLAND,
WASHINGTON, U.S.A.,
AUSTRALIAN & OTHER
BRITISH COLONIES, &
GERMANY.

WORKS:—SYCAMORE ST., SHEFFIELD, ENGLAND. Established 1750.

AMERICAN MADE RAZORS



J. R. TORREY,
MANUFACTURER OF
Strops and Dressing Cases.

J. R. TORREY RAZOR CO.,
MANUFACTURERS OF
Razors in all Styles.

We make the largest and most complete line of Razor Strops ever offered to the trade, including every description and style known. Our Razors are the Standard for excellent cutting quality and elegance of finish, and our prices lower than foreign makes of similar grade. Our Toilet Sets and Dressing Cases are designed for practical use and are made in various attractive styles.
Send for Illustrated Price List—Free to the Trade.

UNDERHILL, CLINCH & CO.,

94 Chambers Street, New York.

DEPOT FOR

NICHOLSON FILE CO.'S FILES.

Russell Jennings' Auger Bits.
Richardson Bros.' Saws.
Geo. Selzer & Co.'s Hatchets, Hammers, &c.
American Screw Co.'s Wood, Machine and Ball
Screws, Stove and Tire Bolts, Rivets, &c.
Brady's Brick Trowels.

O. Ames & Son's Shovels, Spades and Scoops.
E. W. Gilmore & Co.'s Strap and T Hinges.
A. Field & Son's Tacks, Brads, Nails, &c.
W. & S. Butcher's Edge Tools.

GENERAL HARDWARE.

WINSLOW'S "VINYARD" ROLLER SKATES.



BEST IN THE MARKET.
STRONG AND DURABLE.
MOST RELIABLE.

MORE OF THIS KIND USED THAN ALL OTHERS TOGETHER.

SELLING AGENTS,

DAME, STODDARD & KENDALL,

SUCCESSORS TO

BRADFORD & ANTHONY,
374 Washington Street, BOSTON, MASS.

Illustrated Catalogues Furnished upon Application.



PAYSON'S PATENT
Anti-Friction
CASTERS.

Send for
Catalogue and
Discounts to

PAYSON
MANUFACT'G CO.,

1319 to 1325 Jackson St.,

AGENTS: CHICAGO, ILL.

H. J. BRAINERD, 125 Chambers St., New York.
J. R. PAYSON Jr., 109 E. 12th St., Kansas City Mo.

THE UPSON NUT CO.

MANUFACTURERS OF

Bolts, Nuts, Washers,
CARRIAGE HARDWARE, &c.

SEND FOR PRICE LIST.

Warehouses: 99 Chambers St., New York.
132 Lake St., Chicago.

Factories: Unionville, Conn.
Cleveland, Ohio.

**BLAKE
CRUSHER CO.,**
New Haven, Conn.



**BLAKE'S
Challenge Rock Breakers.**
Patented Nov. 18, 1879.

See The Iron Age first issue of the
month.

CORPORATE MARK.



Joseph Rodgers & Sons,
(LIMITED)

CELEBRATED CUTLERY,

No. 52 Chambers Street, New York.

F. & W. CLATWORTHY, Agents,

The demand for Joseph Rodgers & Sons' productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam-power.

To distinguish Articles of Joseph Rodgers & Sons' Manufacture, please to see that they bear their Corporate Mark.

ESTABLISHED 1836.

ALFRED FIELD & CO.,

93 Chambers and 75 Reade Streets,

NEW YORK,

SOLE AGENTS FOR

Ely Bros., Caps, Wads, &c.,

Joseph Elliot & Sons, Razors,

Isaac Greaves, Sheep Shears, &c.,

Robert Sorby & Sons, Sheep Shears, &c.,

Edward Elwell, Hoes, &c.,

R. & J. Linacre, Grass Hooks and Sickles,

Webster & Horsfall Steel Wire,

GENERAL AGENTS

Western File Co.'s American Files.

HEADQUARTERS FOR

ANVILS CHAIN CUTLERY, GUNS,

&c. &c. &c.

A. F. BANNISTER & CO.

SUCCESSORS TO

FURNESS, BANNISTER & CO.,

MANUFACTURERS OF

TABLE CUTLERY,

Cor. Nassau & Sheffield Sts., NEWARK, N. J.



WALDRON & SPROUT,

Manufacturers of

Sawyer's Double and Single Shear

Horse Hay Forks

And

Sprout's

HAY ELEVATORS,

PULLEYS and

GRAPPLERS.

Send for Circulars.

Honey, Looming Co., Pa.

Will Quote You Specially Low Prices for English and Belgian

GUNS,

Breech and Muzzle Loading Guns; also on cheap grade Revolvers. Send for quotations.

JOHN W. HUTCHINSON,

81 CHAMBERS STREET. - - - NEW YORK.



JOHN WIGFALL & CO.,

Manufacturers of Every Description of

TABLE CUTLERY,
Bread & Butchers' Knives & Steels

CORPORATE MARK: "BONA-FIDE."

Aukland Works, Sheffield, England.

SEND FOR ILLUSTRATED CATALOGUE TO

J. CURLEY & BROTHER,

SOLE AGENTS FOR THE UNITED STATES.

ALSO IMPORTERS OF THE FOLLOWING GOODS:

* * JOSEPH RODGERS & SONS,

Pocket & Table Cutlery, Razors & Scissors.

CHESTERMAN'S

Measuring Tapes.

Agents for HUDSON CUTLERY CO., Solingen, Germany.

GUERRE FILS,

French Scissors, Knives.

JOHN CLARKE & SON, Sheffield,

Razors.

CUTLERY in Every Variety of Foreign and Domestic

Manufacture.

* * X L GEO. WESTENHOLM & SON,

Pocket Knives & Razors.

"BENGALL" and JOHNSON'S

Razors.

SABATIER

French Cook's Knives.

"SCHNEIDER" KNIVES,

Genève.

J. CURLEY & BROTHER,

134 & 136 Nassau and 11 & 13 Beekman Streets,

P. O. BOX 2169.

THREE PRIZE MEDALS.

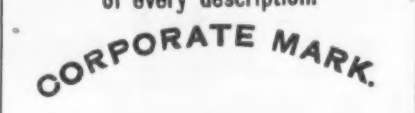


MATTHIAS SPENCER & SONS,
ALBION STEEL WORKS, SHEFFIELD,
MANUFACTURERS OF

**FILES
AND
STEEL,**

Table Knives, Razors, Shovels, &c., &c.,
of every description.

CORPORATE MARK.



**SPENCER
SHEFFIELD**

Granted 1749.

W. & S. BUTCHER,
SHEFFIELD, ENGLAND,

Manufacturers of
Files and Edge Tools.

STAMPED
W. BUTCHER.

ALSO OF
RAZORS AND POCKET CUTLERY

STAMPED
WADE & BUTCHER.

NOTICE is hereby given to all manufacturers
or dealers, that any person imitating our registered
Trade Marks, or simulating the same,
or dealing in goods marked in imitation of our
stamps, will be duly prosecuted and held liable for
damages arising from any infringement of our
legal rights.

W. & S. BUTCHER,
Office in New York, 135 Duane St.

GEO. H. CREED,
SHIP CHANDLERY,
108 Reade Street, New York.

Manufacturers of and Wholesale Dealers in
Cotton and "Long Flax" Sail Duck,
Cotton and Linen Ravens,

Creed's Patent Ships' Crews. Helman's Wire Rope
Spicers. Agent for Raymond's American Crane Oil
for lubricating Cylinders and Valves.

THE BACKSTRAIN when the wrench is used is borne
by the bar—not by the handle.
The strongest Wrench made, and the only suc-
cessful Re-enforced Bar.
None genuine unless stamped
A. G. COES & CO.

Our Agents, JOHN H. GRAHAM & CO., 113 Cham-
bers St., New York, carry a full line of our goods,
and will be pleased to serve you at factory prices.

HILL'S
Eureka Dryer.

THE BEST
In the Market
For Indoor Use.

Also Manufacturers of
HILL'S
CHAMPION DRYER.

For illustration see last Iron
Age. Circulars and discounts
to the trade on application.

HILL DRYER CO.,
Worcester, Mass.

PATENT APPLIED FOR.

PATENTS.

Experienced in soliciting United States and Foreign
Patents prior and subsequent to service in United
States Patent Office. Personal attention to every
case from beginning to end. Practical and theo-
retical knowledge of the mechanic arts. Prompt and
skillful prosecution of applications for Patents,
Designs, Trade-Marks and Labels. Expert
Searches and Opinions as to scope, validity and
infringement. Representatives in over thirty foreign
countries. Terms reasonable, and always agreed
upon before any expense is incurred. Send for
circular. Ten Years' Experience.

E. B. STOCKING,
Attorney-at-Law,
Opp. Patent Office, WASHINGTON, D. C.

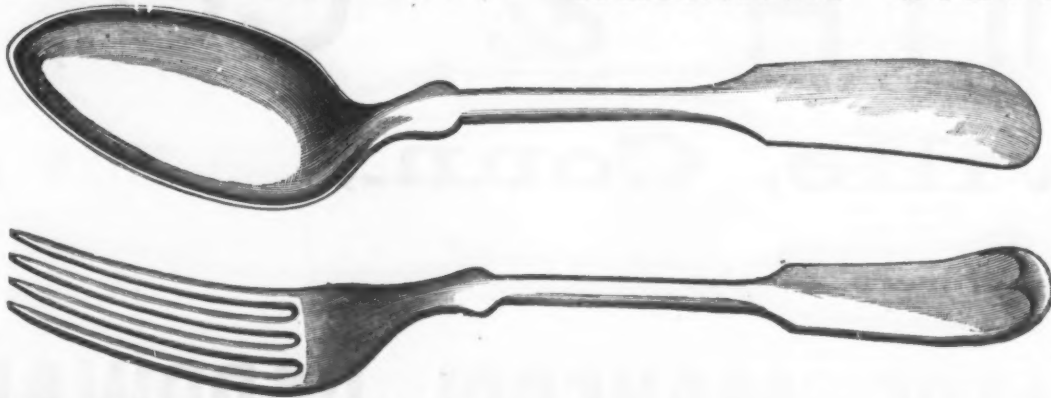
RUSSIAN OR SWISS CHIME SLEIGH BELLS,
Plumes and Body Strap Bells,
MANUFACTURED BY
THE CHAPMAN MFG. CO., Meriden, Conn.

Established 1838.
Bevin Bros. Mfg.
Co.,
Easthampton, Ct.
Manufacturers of
SLEIGH BELLS,
House, Tea, Hand,
Gong Bells, &c.
Bell Metal Kettles.

CHAS. E. LITTLE,
59 FULTON STREET, NEW YORK,
AGENCY FOR
Barnes' Foot-Power Machinery
AND
Shipman's Steam Engines,
and the following Specialties: Coopers' and Slaters'
Tools, Solid Cast Steel Pump Augers and Reamers

CHAS. E. LITTLE,
59 FULTON STREET, NEW YORK,
AGENCY FOR
Barnes' Foot-Power Machinery
AND
Shipman's Steam Engines,
and the following Specialties: Coopers' and Slaters'
Tools, Solid Cast Steel Pump Augers and Reamers

HALL & ELTON'S GERMAN SILVER



In addition to Spoons of this well-known brand, we are now prepared to furnish Forks of the same quality. We GUARANTEE these goods to be SOLID and of UNIFORM quality throughout, with no coatings to wear through or flake off, and with no liability to RUST.

HALL, ELTON & CO. Wallingford, Conn., and 47 East 13th St., New York.

THE DELUSION MOUSE TRAP.



The Mouse goes in to get the bait And shuts the door by his own weight. And then he jumps right through a hole thinks he's out; but, bless his soul He's in a cage, somehow or other, And sets the trap to catch another.

MANUFACTURED EXCLUSIVELY BY THE

LOVELL MFG. CO., LIMITED, ERIE, PA.

A. F. PIKE MFG. CO.,

Pike Station, New Hampshire, U. S. A.

Cable Address, "Pike, Haverhill."

MANUFACTURERS AND WHOLESALE DEALERS IN

BLUE STONE.

The Largest Manufacturers and Dealers in Stones for Sharpening all Edge Tools.

Pike's celebrated Blue Stone, Indian Pond (Red End), Lamotte, Black Diamond, Magic Green Mountain. All kinds of brand with our name are genuine.

Also, Oil, Water and Dry Whetstones; Arkansas, Washita, Turkey, Hindostan, and Sandstone; Razor Stones, Vienna Cigar-shape.

In fact, everything that is used for sharpening Edge Tools supplied in any grit or shape required. Quality and Prices guaranteed. Send in your orders.

WILSON BROS., Easton, Pa., U. S. A.

A discount to the Trade only.

MORTON'S LIGHTNING KEY-WAY CUTTER

will cut a key-way 12 in. long and 1/4 in. wide and perfectly straight; also 20 x 3 in. key-ways per hour, and can be set to cut them exactly alike. Tools for cutting large key-ways are as easily made and kept in order as a cold-chisel.

For circulars, address Morton Mfg. Co., Romeo, Mich.

Grinds wet, green, greasy or dry bones.

Prices for Hand use, from \$5 to \$15. For Power use, from \$20 to \$300. Illustrated circulars and testimonials on application.

WILSON BROS., Easton, Pa., U. S. A.

A discount to the Trade only.

MORTON'S LIGHTNING KEY-WAY CUTTER

will cut a key-way 12 in. long and 1/4 in. wide and perfectly straight; also 20 x 3 in. key-ways per hour, and can be set to cut them exactly alike. Tools for cutting large key-ways are as easily made and kept in order as a cold-chisel.

For circulars, address Morton Mfg. Co., Romeo, Mich.

Grinds wet, green, greasy or dry bones.

Prices for Hand use, from \$5 to \$15. For Power use, from \$20 to \$300. Illustrated circulars and testimonials on application.

WILSON BROS., Easton, Pa., U. S. A.

A discount to the Trade only.

MORTON'S LIGHTNING KEY-WAY CUTTER

will cut a key-way 12 in. long and 1/4 in. wide and perfectly straight; also 20 x 3 in. key-ways per hour, and can be set to cut them exactly alike. Tools for cutting large key-ways are as easily made and kept in order as a cold-chisel.

For circulars, address Morton Mfg. Co., Romeo, Mich.

Grinds wet, green, greasy or dry bones.

Prices for Hand use, from \$5 to \$15. For Power use, from \$20 to \$300. Illustrated circulars and testimonials on application.

WILSON BROS., Easton, Pa., U. S. A.

A discount to the Trade only.

MORTON'S LIGHTNING KEY-WAY CUTTER

will cut a key-way 12 in. long and 1/4 in. wide and perfectly straight; also 20 x 3 in. key-ways per hour, and can be set to cut them exactly alike. Tools for cutting large key-ways are as easily made and kept in order as a cold-chisel.

For circulars, address Morton Mfg. Co., Romeo, Mich.

Grinds wet, green, greasy or dry bones.

Prices for Hand use, from \$5 to \$15. For Power use, from \$20 to \$300. Illustrated circulars and testimonials on application.

WILSON BROS., Easton, Pa., U. S. A.

A discount to the Trade only.

MORTON'S LIGHTNING KEY-WAY CUTTER

will cut a key-way 12 in. long and 1/4 in. wide and perfectly straight; also 20 x 3 in. key-ways per hour, and can be set to cut them exactly alike. Tools for cutting large key-ways are as easily made and kept in order as a cold-chisel.

For circulars, address Morton Mfg. Co., Romeo, Mich.

Grinds wet, green, greasy or dry bones.

Prices for Hand use, from \$5 to \$15. For Power use, from \$20 to \$300. Illustrated circulars and testimonials on application.

WILSON BROS., Easton, Pa., U. S. A.

A discount to the Trade only.

MORTON'S LIGHTNING KEY-WAY CUTTER

will cut a key-way 12 in. long and 1/4 in. wide and perfectly straight; also 20 x 3 in. key-ways per hour, and can be set to cut them exactly alike. Tools for cutting large key-ways are as easily made and kept in order as a cold-chisel.

For circulars, address Morton Mfg. Co., Romeo, Mich.

Grinds wet, green, greasy or dry bones.

Prices for Hand use, from \$5 to \$15. For Power use, from \$20 to \$300. Illustrated circulars and testimonials on application.

WILSON BROS., Easton, Pa., U. S. A.

A discount to the Trade only.

MORTON'S LIGHTNING KEY-WAY CUTTER

will cut a key-way 12 in. long and 1/4 in. wide and perfectly straight; also 20 x 3 in. key-ways per hour, and can be set to cut them exactly alike. Tools for cutting large key-ways are as easily made and kept in order as a cold-chisel.

W. H. McMILLAN,

113 South St. (Up-stairs), Bet. Peck Slip and Beekman St.,

NEW YORK,

BLOCK AND PUMP MANUFACTURER.

Manufacturer of Inside Iron Strap and all kinds Tackle Blocks,

MAST HOOPS, HANKS, RELAYING PINS, HAND SPIKES, HAND PUMPS, &c.

Also Dealer in Lignumvite Wood, for Beam Faces and Roller Beds, &c.

TELEPHONE CALLS:

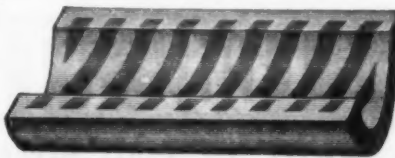
Office, "Nassau 142." Factory, "Williamsburg 377."

FACTORY:

32 to 40 Penn St., Brooklyn, E. D.

SOLE AGENT FOR

John Smalley's Graphite Bushings.



The Celebrated Pieper Breech-Loading Guns.

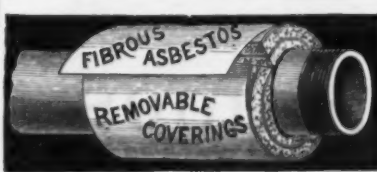


SOLE AGENTS,

SCHOVERLING, DALY & GALES, 84 & 86 Chambers St., New York.

WHOLESALE ONLY. SEND FOR CATALOGUE.

COVERINGS.



Made in sections three feet long to fit every size of pipe. Absolutely Fire-Proof—Light, Cheap. Can be applied by unskilled labor.

The Celebrated Patent Air Space Covering for Steam Boilers and Pipes, Hot Blast Piping, &c.

Asbestos Materials, Fibre, Millboard Packing and Cement.

Address CHALMERS-SPENCE CO.,

131 FIRST AVE., PITTSBURGH, PA. 419 & 421 EIGHTH ST., NEW YORK.

Boiler Explosions and Inspections in Great Britain.

The recently issued report of Mr. Henry Hiller, chief engineer of the National Boiler Insurance Company, of Manchester, England, furnishes ample material for reflection on the management of boilers generally, and the ways and means adopted by English boiler inspection and insurance companies. This matter, as some of our readers will no doubt remember, was referred to at some length in several of our recent issues, but still the importance and interest attached to the subject justify its more extended consideration. Strictly speaking, the account given by Mr. Hiller embraces nothing new, being the usual record of ignorance and neglect, resulting in disaster. "Some parties," writes Mr. Hiller, "appear to imagine that boilers may be left to take care of themselves, and thus adopt no effective measures to ascertain their actual condition by thorough inspection—a mistaken confidence which is liable under such circumstances to be at any time dissipated by disastrous explosion. Such persons apparently forget that owners or managers, as well as work-people, are often included among the victims of boiler explosions. In some of the mining districts especially we have met with boilers in most disgraceful and dangerous condition; and many explosions have occurred through the generally deteriorated condition of the boilers which were attributed by those responsible to causes which in no way contributed thereto."

Commenting on the above, our contemporary, the *London Engineer*, submits the following, replete with severe but just criticism, whose careful consideration is much to be commended, and would, no doubt, tend to bring about a more satisfactory state of affairs:

It is not necessary to go to the mining districts for examples of neglect. They may be found in the heart of Manchester, of London, of Liverpool, of all manufacturing centers. The causes which bring them about scarcely seem to be quite understood by boiler-insurance companies and their engineers. Mr. Hiller and his professional brethren are indignant that lives should be lost and property wasted year after year by strictly preventable boiler explosions. This is quite natural. We could wish, however, that they dived a little below the surface, and set themselves the task of discovering the reasons why boilers are not properly inspected and cared for. Before they can be removed or fairly combated their nature must be ascertained. Not one cause or a dozen induces neglect of sufficiently obvious precautions. They vary in different districts and with different trades and individuals. One, however, appears to us to continually present itself, and this is want of faith in the operations of the boiler inspector. Thus, for example, two firms may carry on their business side by side; the one insures its boilers; the other does not. Yet years elapse and no explosions take place; apparently no advantage of any kind has been gained by inspection, while a great deal of so-called unnecessary trouble has been incurred. Unfortunately, or fortunately, a boiler will stand a great deal before it bursts, and men are slow to believe that a small crack or a little corrosion can really be such a serious matter as the inspector tells them it is. If, on the other hand, the percentage of disastrous boiler explosions was much larger than it is, then insurance and inspection would be much more resorted to than they are. Again, even of the explosions that do occur, only a percentage could have been avoided by inspection pure and simple. Mr. Hiller tells us that he has received reports of 42 explosions which occurred in the United Kingdom in 1883, by which 22 persons were killed and 57 severely injured. This does not include kitchen boilers. Since the establishment of the National Boiler Insurance Company in July, 1864, he has had reports of 945 explosions, by which 1092 persons were killed and about 1820 injured. Now, when we come to analyze these figures, we find that 264 arose from defective condition, 213 from congenital malconstruction, the boilers being bad even when new; 71 were due, according to Mr. Hiller, to the boilers being externally fired, while no fewer than 250 were the results of neglect on the part of attendants or of mismanagement of some kind. It will be seen that of the total only 264, or little more than one-fourth, could have been avoided by the most careful inspection. Of these explosions 141 were due to external and 47 to internal corrosion, 44 to general deterioration, 27 to internal grooving and 7 to defective stays. Of the 250 due to neglect or mismanagement, overpressure accounts for 104, shortness of water for 123, overheating through deposit for 21 and overheating through defective flues for 2. With these 250 it is difficult, if not impossible, to see how any insurance company can grapple. The world of steam users is not slow to understand this, and it has often been urged to us that inspection is not half as good as it looks, because boilers explode from causes with which the question of inspection or non-inspection has nothing to do. We have here, we think, one other prominent reason why all boilers are not insured, or, at least, inspected.

To make the system more generally useful we hold that the scope of inspection and insurance should be enlarged, and that certain rules now in force should be altered or withdrawn altogether. The insurance companies would very willingly take action in the direction we are about to indicate, but for two reasons. The first is the unpopularity of boiler insurance, or, more strictly, of inspection; and, secondly, the keen competition which exists among rival companies. This prevents them from dealing with their clients with due firmness. Under existing conditions the companies always pay for collapsed flues, no matter how the collapse is brought about, and this constitutes the principal charge on the funds of the insurance companies. The sum disbursed as a result of explosions is extremely small; that paid for collapsed flues is very large. These collapses hardly ever appear in the reports of the engineers; the knowledge of them is confined to the insured and insurers. Thus, a pair of furnace crowns in a Lancashire boiler come

down, no one is hurt, and no other mischief is done. The old plates are cut out and new plates put in at the expense of the insuring company. In 99 cases out of 100 the collapse is due to shortness of water, and this is due in turn to the fireman, and may, if we continue the trace, be finally brought home to the nearest beer-shop. If insuring companies absolutely declined to pay for flues collapsed by shortness of water, the direct result would be that a much better class of firemen would be employed. The present system holds out a premium for the employment of inefficient men. The insurance companies, assert, however, that they dare not make a change in the direction we indicate, for if they did they would get no business; and that this argument has a foundation in fact is proved by the circumstance that, while about 50,000 boilers are inspected by various insurance companies, the Manchester Steam Users' Association has only about 4600 boilers on its books—a result mainly attributable to the extreme caution exercised in accepting boilers. As regards malconstruction, the engineers to all the insurance and assurance companies willingly advise their clients. But so long as low-priced boilers are sought for and bought, so long will bad boilers be used. No one who has not had personal experience can imagine how bad some boilers are. Were we to mention cases which have come under our own knowledge they would hardly be believed. Here is a case cited by Mr. Hiller: A vertical boiler, with internal fire-box, high about 7 feet 8 inches, diameter 4 feet 3 inches, exploded. On examining the boiler, after explosion, the riveting of the bottom ring seam, uniting the shell and the fire-box, was found to be very defective. When these were put together the holes had evidently not corresponded, and a second set of holes had been punched, the punchings being used to fill up the spaces of the original holes, the result being that the metal between each hole was little more than 1/4 inch, and even less in some places, and this must have been severely strained, if not entirely fractured, by the punching and subsequent treatment. The rent occurred at the line of rivets referred to, and extended in various directions through the solid plate of the shell, which was torn to pieces. The surrounding property was damaged, and two men injured. We quite agree with Mr. Hiller that "this was a gross case, and deserved criminal punishment." The difficulty is to devise means by which it may be inflicted when it is deserved. We have said that the causes which induce neglect of obvious precautions vary with circumstances and individuals. As an illustration of the truth of this we may call attention to the fact that while there occurred in the United States last year 184 explosions, by which about 300 persons were killed, no fewer than 74 of them, or about 40 per cent., took place in saw mills, and carelessness and ignorance were the principal causes. What is the connection between saw mills and boiler explosions we are not prepared to say.

Mr. Hiller comments somewhat sharply on the attempts which have been made by Mr. Fletcher to underrate the value of insurance. In this matter, as in all others, the truth lies between extremes. So long as the insurance companies carried on their operations without attempting to secure business on ruinous terms, nothing was to be said in favor of Mr. Fletcher's arguments. But, as we have already pointed out, the case is altered as soon as it can be shown that the insurance system is attended by the employment of incompetent firemen or risky feeding arrangements. The practice of making good damage to flues and furnaces brought about by drink, or ignorance, or negligence, cannot be too much deprecated; and Mr. Hiller will have to show a much better case than has yet been brought before us before we can regard that practice as in any sense or way desirable. If it is definitely stated that it must be done, then there is, of course, an end of the matter. If, however, all the insurance companies would combine on this point and declare that they would not pay for short-water defects, what would be the result? We shall not attempt to give an answer, for a great deal would depend on the new conditions established.

Novel Application of Wind Power.—A remarkable shipment of wind-mill machinery and apparatus was made to the port of Bahia, Brazil, by the United States mail steamer, *Advance*, on her last trip. It was the third and largest of three wind-mills built by A. J. Corcoran, of this city, to be used in the manufacture of salt pumped from the sea. Worked together, these mills operate seven pumps, which elevate an average of 18,000 gallons of water per hour. Some of the castings weighed as heavy as 2300 pounds. The main pump shaft, which is 4 inches square, comes from the works of the Bridgeport Forge and Hammer Company, and by an ingenious contrivance called a "windlass" is so arranged that any one or all of the seven pumps could be lifted with their connection. This apparatus was shipped complete in every detail, not only the wind engine, but the pumps, pipes and tower on which the mill is to be erected, also including the anchors which give solidity to the foundations. The aggregate weight is 45 tons and the cost about \$5000. We are informed that windmills find a constantly widening market, shipments being made to foreign ports almost every week. The latest had Orange Free State, in South Africa, Barcelona, in Spain, and Venezuela for their destination. One for South Africa was for a sheep pasture, to supply water. Another recently sent out to Hayti was a geared mill, designated to drive six cotton gins. Numerous mills have gone to Australia, where they are used chiefly for irrigation. Owing to the prostration felt everywhere among sugar manufacturers, this branch of trade with Cuba has almost wholly ceased.

How to Cool a Room in Summer.—The composing-room of the *New Orleans Picayune* is situated in the upper story of its publication house, just under the roof, and in summer is extremely hot. An inspiration seemed to have come to one of the oppressed occupants, and in accordance with it a vertical wooden box was constructed in the corner of the room, with openings at the floor

TRAVELING JIB AND PILLAR CRANES.

Weston's Patents. Any Capacity.

CAN BE OPERATED BY HAND OR POWER.

ARE ABSOLUTELY SAFE FOR OPERATOR AND LOAD.

Simple, Durable, Convenient and Economical.

USED BY THE BEST SHOPS AND FOUNDRIES. PLANS AND ESTIMATES ON APPLICATION.

YALE & TOWNE MFG. CO.,

Manufacturers, Engineers and Machinists,

STAMFORD, CONN.

NEW YORK, 62 Reade Street,

PHILADELPHIA, 15 N. Sixth Street,

BOSTON, 224 Franklin Street.

CHICAGO, 64 Lake Street.

CATALOGUES ON APPLICATION.

H. D. SMITH & CO.,

Plantville, Conn.,

Manufacturers of the

BEST QUALITY CARRIAGE MAKERS' HARDWARE,

Manufacture the Largest Variety of Forge Carriage Irons, of Best Material and Workmanship.

PRICES LOW FOR QUALITY OF WORK FURNISHED.

SEND FOR PRICE LIST.

BEST CAST U.S. TOOL STEEL BROWN & CO. PITTSBURGH, PA.

TEMPLE & LOCKWOOD, 12 Platt Street, New York, Agents.

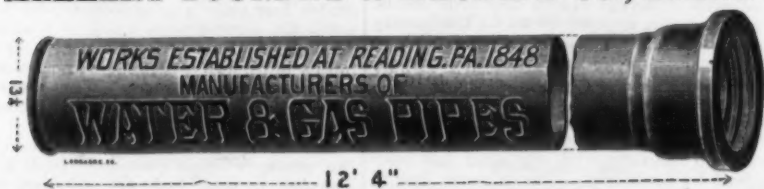
CLEAN, GOOD STYLE, EXTRA HANDSOME WHIFFLETREE, STEP, AND OTHER FANCY HEAD BOLTS,
MADE FROM EXTRA NORWAY IRON.

WILLIAM C. LANMAN, NORWICH BOLT WORKS, NORWICH, CONN.

ARNOLD MELLERT, Chairman.

P. D. WANNER, Secretary and Treasurer.

MELLERT FOUNDRY & MACHINE CO., Limited.



SPECIAL CASTINGS, such as Branch Pipe, Bends, Reducers, Sleeves, Curves, &c. STOP VALVES for Water and Gas from 2 to 48 inches in diameter. FIRE HYDRANTS, RETORTS, and LAMP POSTS. FLANGE PIPE of all sizes in use. General Machinery and Castings. Car and Railroad Castings. The Improved Canada Turbine Water Wheel. Structural Work (Ornamental and Plain).

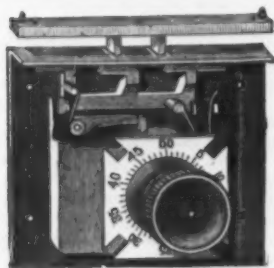
GENERAL OFFICE AT READING, PA.

A. FIELD & SONS,
MANUFACTURERS OF

WIRE NAILS

Of Every Quality and Description.

Taunton, Mass., and 78 Chambers Street, New York.



TAYLOR'S DUPLEX COMBINATION LOCKS.

The Cheapest and Best in the World. Send for Prices.
RETAIL FROM \$1.50 TO \$3.00. 2500 CHANGES.

FOR ALL PURPOSES.
TAYLOR MFG. CO.,
NEW BRITAIN, CONN.

SAMUEL A. HAINES,

IRON AND HARDWARE

Commission Merchant,

88 CHAMBERS ST., NEW YORK,

AGENT FOR

EDWIN HILLS,

MANUFACTURER OF

Wood Hames
AND
SADDLERY HARDWARE,

My friends will do themselves a favor by corresponding with me for prices before placing their orders.

I Ship all Goods from the Factory and at Factory Prices.

NOTE THE CHANGES THAT OCCUR IN THIS SPACE WEEKLY.



W. R. OSTRANDER & CO.,

21 & 23 ANN STREET, NEW YORK,

Manufacturers of
SPEAKING TUBES, WHISTLES, ELBOWS, ORAL ANNUNCIATORS, BELL & ELECTRIC WIRE TUBING.

Complete outfits of Speaking Tubes, Whistles, Pneumatic Bells, &c. A full line of Speaking Tube Hardware constantly on hand. Catalogues on application. Factory, DeKalb Ave., near Knickerbocker, Brooklyn, L. I.



RHODE ISLAND HORSE SHOE CO.,

MANUFACTURERS OF

Horse, Mule & Snow Shoes of the Perkins Pattern.

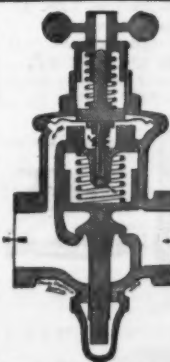
Works at Valley Falls, R. I.

Office, 31 Exchange Place, Providence, R. I.

W. CARPENTER, President.

C. H. PERKINS, Gen'l Manager.

R. W. COMSTOCK, Secretary.



CURTIS PRESSURE REGULATOR,

FOR
STEAM and WATER,
is made entirely of metal occupies the same space as a globe valve. It has no glands or packing, and is a lock-up valve. Write for circular. Manufactured by

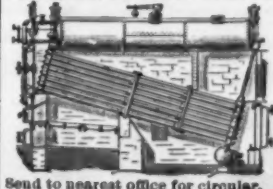
Curtis Regulator Co.,

61 Beverly St., Boston, Mass.

General Agencies: 100 Liberty St., N. Y.; 19 No. 7th St., Philadelphia; 80 & 82 Market St., Chicago; 49 Holiday St., Baltimore; 24 6th St., Pittsburgh.

THE BABCOCK & WILCOX CO.
WATER-TUBE STEAM BOILERS.

107 Hope St., GLASGOW. 30 Cortlandt St., NEW YORK.



BOSTON: 50 Oliver St.
PHILADELPHIA: 32 N. 4th St.
PITTSBURGH: 38 4th Ave.
CHICAGO: 61 S. Canal St.
NEW ORLEANS: 14 Carondelet St.
SAN FRANCISCO: 54 Mission St.
CINCINNATI: 44 W. 3d St.

Send to nearest office for circular.

COBB & DREW

Plymouth, Mass.,

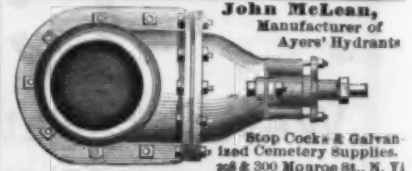
Manufacturers of Copper, Brass and Iron Rivets; Common and Swedes Iron, Leathered, Carpet, Lace and Gimp Tacks; Finishing, Hungarian, Trunk, Clout and Cigar Box Nails, &c. Rivets made to order.

NEW YORK AGENCY,

GRUNDY & DISOSWAY,
HARDWARE,

165 GREENWICH STREET,

Agents for the Philadelphia Star Carriage and Tire Bolts.



John McLean,
Manufacture of
Ayres' Hydrants

Stop Cocks & Galvanized Cemetery Supplies.
208 & 300 Monroe St., N. Y.



STILLMAN & Co.
Engraving
ON WOOD
N.W. COR. FRONT & VINE
CINCINNATI OHIO.

STEEL FORGINGS

From 100 Pounds to 10,000 Pounds.

Pennsylvania Steel Company.

Address

L. S. BENT, Supt., Steelton, Dauphin Co., Pa., Or STEPHEN W. BALDWIN, Agt., 160 Broadway, N. Y.

A. WYCKOFF,

Manufacturer of



WOOD WATER PIPE

FOR

MINES, COKE OVENS AND WATER WORKS.

Chain Pump Tube, Curbs, &c.

ELMIRA, N. Y.

R. COOK & SONS,

Manufacturers of

Carriage & Wagon AXLES.

WINSTED, CONN.

ESTABLISHED 1839.

N. Y. MALLET and HANDLE WORKS



Manufacturers of

Calipers, Carpenters', Stone Cutters', Tin, Copper and Boiler Makers' MALLETs,

Hawking Bevels, Hawking and Calking Irons; also all kinds of Handles, Sledge, Chisel and Hammer Handles, Also

COTTON AND BALD HOOKS, Patented Feb. 13, 1877; a new combination of Hooks, 426 E. Houston St. New York City.

158 CHAMBERS ST. NEW YORK CITY
F. R. EMMONS & BRO.
TACKS
E. PHILLIPS & SONS, MANUFACTURERS, SO. MASS.

THE MENEELY HARDWARE CO.,

WEST TROY, N. Y.

Improved German and Safety Harness Snaps, Link Snaps, &c. Rope and Web Halters, Cattle Ties, &c. Breast, Halter and Hitching Chains. HORACE F. SISE, Agt., 100 Chambers St., N. Y. City. Send for Illustrated Circular and Price List.

J. P. SWENEY & CO.,

613 N. Main Street, ST. LOUIS, MO.,

SELLING AGENTS FOR MANUFACTURERS OF METALS, MACHINERY and RAILWAY SUPPLIES.

Correspondence solicited.

COLD ROLLED
Steel Figures and Letters.
SEND FOR CIRCULAR.
Bellows & Dickey, 145 Seneca St., Cleveland, O.

The Bolton Steel Co.

CANTON, OHIO,

MANUFACTURERS OF BEST REFINED

Tool Steel

And Other Fine Grades of

CAST STEEL

EUREKA SAP SPOUTS. Sold by Hardware and Tin Dealers. Samples and terms sent free to the Trade. Address all orders to C. C. POST, Patentee, Burlington, Vt.



Seamless Cotton and Milled-proof, Rubber Lined "Eureka Garden Hose." IN 3/4 AND 1 INCH SIZES. Price Lists and Discounts on application. EUREKA FIRE HOSE CO., 13 Barclay St., NEW YORK.

KEYSTONE SCREW CO.,

17th and Venango Sts., Philadelphia.

J. BILLERBECK, Manufacturer of IRON AND BRASS Gimlet-Pointed Wood Screws. WRITE FOR DISCOUNTS.

Vulcanized Rubber Fabrics

ADAPTED TO

MECHANICAL PURPOSES.

RUBBER BELTING and PACKING.

Machine Belting, Steam Packing, Leading Hose, Suction Hose, Grain Elevators, Steam Hose, Piston Rod Packing, Gaskets and Rings,



Vacuum Pump Valves, Ball Valves, Car Springs, Wagon Springs, Gas Tubing, Machine Belting, Billiard Cushions, Emery Wheels.

This company manufactured the immense DRIVING and ELEVATOR BELTS for the Buckingham Elevators at Chicago, which have been running perfectly for more than Twelve Years, also those for Armour, Dole & Co. of Chicago, Vanderbilt's Elevators for the N. Y. Central & Hudson River R. R., the great Elevators of the Penna. and Erie Railroads, of Jersey City and Hoboken, Dow's Stores, of Brooklyn, and many others. In fact, the largest Belts for the largest Elevators in the world. A single carrier belt in the Penna. R. R. Elevator is over 200 feet long, weighing 18,000 pounds, and has run perfectly from the start.

LINEN and COTTON HOSE.



Plain and Rubber Lined,

Circular Woven-Seamless Antiseptic RUBBER LINED "CABLE" HOSE and "TEST" HOSE, Vulcanized Para Rubber and Carbolized Duck, for the use of Steam and Hand Fire Engines, Force Pumps, Mills, Factories, Steamers, Ships, Hospitals, &c



"TEST" HOSE.

"CABLE" ANTISEPTIC.

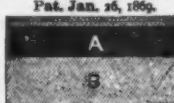
Emery Wheels and Packing.



Solid Vulcanite EMERY WHEELS

Emery Wheel. LARGE WHEELS MADE ON CAST-IRON CENTER IF DESIRED. Section of Emery Wheel showing Iron Center.

The properties of these Wheels are such that they can be used with great advantage and economy for cutting, grinding and finishing Wrought and Cast Iron, Chilled Iron, Hardened Steel, Slate, Marble, Glass, etc. These wheels are extensively used by manufacturers of Hardware, Cutlery, Edge Tools, Plows, Saws, Stoves, Fire Arms, Wagon Springs, Axles, Skates, Agricultural Implements, and small Machinery of almost every description.



Rubber Back Square Packing.

BEST IN THE WORLD.

For Packing the Piston Rods and Valve Stems of Steam Engines & Pumps. It represents that part of the packing which, when in use, is in contact with the piston rod. A the elastic back, which keeps the part B against the rod with sufficient pressure to be steam tight, and yet creates but little friction. This Packing is made in lengths of about 30 feet, and of all sizes from 1/4 to 1 inches square.

Corrugated Rubber Mats and Matting.



For Halls, Flooring, Stone and Iron Stairways, &c.



This practical and indispensable article—especially for wear where exposed to ice, snow or slush—was first introduced by this company several years ago, and its real value is in being almost indestructible, when proper materials are used in its manufacture, whilst the cheap inferior quality forced on the public by reckless imitators of our patent goods soon becomes brittle and crumbles to pieces. Address

NEW YORK BELTING & PACKING CO.,

Warehouse, 15 Park Row (Opposite Astor House), New York.

Branches, No. 308 Chestnut St., Philadelphia, and 164 Madison St., Chicago. JOHN H. CHEEVER, Treas. JOHN D. CHEEVER, Dep. Treas.



BUCK BROTHERS, Millbury, Mass.

The most complete assortment in the U. S. of Shank, Socket Firmer and Socket Framing Chisels. PLANE IRONS.

CAUTION.—Buyers should be on their guard and not have inferior goods palmed on them by unprincipled persons, who represent them as our make. Our tools are stamped "BUCK BROTHERS," and our labels have on our trade-mark also "Riverina Works."

PHOSPHOR-BRONZE

—FOR—

BEARINGS, SLIDE VALVES, CYLINDER RINGS, CROSS-HEAD GIBS, STEPS, BUSHINGS,

And all purposes where Maximum Durability, Anti-Frictional and Non-Cutting Qualities are Desirable.



PUMP RODS, BOLTS & NUTS, MACHINE and WOOD SCREWS, &c., &c.

Combine Toughness, Strength, Durability and Resistance to Corrosion.



"Phosphor-Bronze."

CASTINGS OF ALL KINDS TO ORDER.

SEND FOR PAMPHLET AND PRICES.

THE PHOSPHOR-BRONZE SMELTING CO., LIMITED,

No. 512 Arch St., PHILADELPHIA, PA.

Owners of the U. S. Phosphor-Bronze Patents. Sole Manufacturers of Phosphor-Bronze in the U. S.

Merrill Brothers, 26 First Street, BROOKLYN, N. Y.



HAMMERS, FORGINGS and POWER PRESSES.

and ceiling, and furnished with a pipe for supplying water at the top and a pan and drain at the bottom for receiving the flow and carrying it safely away. The supply-pipe was bent over the upper end of the shaft, and fitted with a rose like that of a watering-pot, so as to deliver a shower of spray instead of a solid stream. On connecting it with a service-pipe the movement of the water was found to cause an active circulation of the air in that part of the room, which was drawn in at the upper opening of the shaft and issued again, cool and fresh, at the floor level. The most surprising thing about the experiment seems to have been the effect of the water in cooling the air to a degree much below its own temperature. With the Mississippi water, which, when drawn from the service-pipe, indicated a temperature of 84°, the air of the room, in which the thermometer at the beginning of the trial stood at 66°, was cooled in passing through the length of the shaft to 74°, or about 20° below the temperature at which it entered, and 10° below that of the water which was used to cool it.

New Blacksmiths' Tools.

The blower made by the Buffalo Forge Company, of Buffalo, N. Y., is mounted on an upright iron frame, firmly braced and stiffened, as will be seen by reference to the cut. It is operated by means of a lever, with the swivel motion so well known to blacksmiths. A downward pressure of the lever engages the pawls with the small



Fig. 1.—Blacksmith's Hand Blower.

ratchet-wheel, having on its outer periphery a fixed shaft, upon which revolves a small and large pinion or gear, cast together. The small pinion, in being thrown forward, is revolved in the opposite direction to its own axis by meshing with the large fixed internal gear, and in turn communicates motion to the large band or fly-wheel, the motion being transmitted by belt to the fan. The entire mechanism is operated on one fixed steel shaft, thereby reducing the friction and wearing of journals, with a combination of strong, heavy, toothed gears, arranged in

southwest storm, which it stood capably. The captain states that he never had a boat going so quietly and safely under his command as this dredger. During the heavy gales not even a plate or tumbler had slipped off the bare table, an occurrence which happens on ordinary steamers with a very moderate sea on. The slot filled with water in the body of the boat not only caused this increased stability, but also allowed it to be kept well to the wind. Of course no progress could be made during the storm. The speed naturally is slow, only 4 knots, and the voyage to the northernmost coast of China is calculated to last five months. Perhaps this steady behavior of the unusual steamer may give some useful hints to the designers of anti-seasickness channel boats.

French Coal Briquettes.—The French manufacturers of "patent fuel," or bricks of coal, particularly in the Nantes district, import a large quantity of coal dust from Cardiff, Swansea and Newport. The process of manufacture is very simple. The coal dust is mixed with pitch and the mixture poured into cups attached to a belt, each cup containing just enough material for a brick of the size desired. The belt in its movement passes this material through a chamber where it is exposed to steam, which fuses the two substances into a homogeneous mass. This is poured by the descent of the belt into molds, where it is subjected to an enormous pressure by a hydraulic press or by machinery set in motion by a steam engine. The brick is square in form, its thickness being about one-third of its other dimensions, and its weight 5, 10 or 15 pounds. Certain of the French railway companies refuse to accept fuel unless at least 10 per cent. of pitch has been used for its agglomeration. It is stated that briquettes are preferable to ordinary coal for exportation to the colonies and to warm climates on account of their compact storage and freedom from small fragments and dust, also for use on locomotives both on account of economy of space and because firemen can determine the amount of fuel they are employing in a given time, the weight of each brick being exactly known. The manufacturers claim that the patent fuel is more healthy for domestic use than ordinary coal, citing in support of this theory the declaration of certain well known physicians. At the present day a large number of bricks are made for domestic use, of small size, and perforated with circular or longitudinal openings.

Dr. Müller in *Zeitschrift des Vereines Deutscher Ingenieure* is thoroughly examined as to his investigations on the absorption of gases by steel. The results arrived at may be thus summarized. The gas liberated from steel in the liquid state before solidification is chiefly carbonic oxide. The rising of steel, and consequently the formation of blow-holes, is attributed to hydrogen and nitrogen, and to a small extent to carbonic oxide.

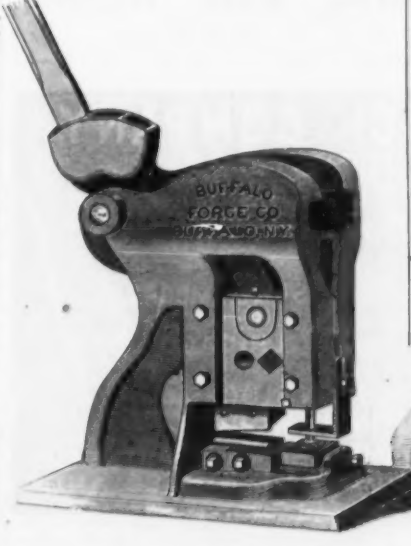
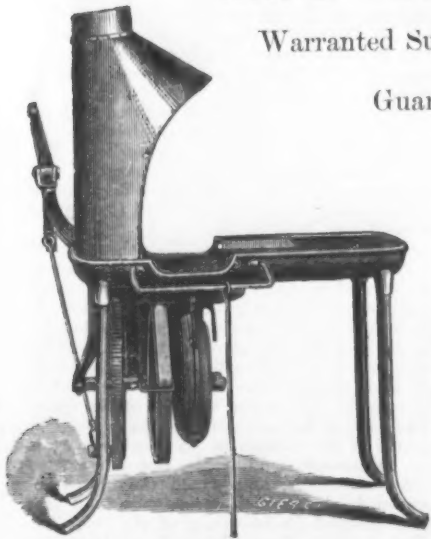


Fig. 2.—Combined Punch, Shear and Bar Cutter.

such a form, it is claimed, as to render it impossible for any slipping to occur. It affords at all times a positive motion, and is easily operated. All parts are made interchangeably, and may be adjusted to their respective places without further fitting. Another advantage claimed for this blower is its compactness, the whole machine occupying but a small space.

Another machine recently put on the market by the Buffalo Forge Company is their combined punch, shear and bar cutter, which is shown in Fig. 2. This punch and shear, which is of new design, operates on the inclined and eccentric principle. As regards the power gained by this method, it may be stated that the construction is such that its proportions of power applied and obtained are as 1 to 125, and, as the power is applied in a rigidly perpendicular direction, no lateral strains are produced. There are but five pieces of castings in its entire construction, with no set-screws, keys or springs in working parts. Three sizes of this punch and shear, Nos. 39, 40 and 41, have a capacity of shearing strap iron from 1/4 inch, 2 1/2 inches wide, to 3/4 inch, 4 inches wide; of punching from 1/4-inch hole in 1/4-inch iron, to 1/2-inch hole in 3/4-inch iron; and of cutting from 1/2-inch to 3/4-inch round or square iron to any length.

BUFFALO PORTABLE FORGES AND HAND BLOWERS.



Warranted Superior to any other make, and
Guaranteed to give Perfect
Satisfaction.

For sale by all the leading
Iron, Hardware and Machinery
Dealers throughout the country

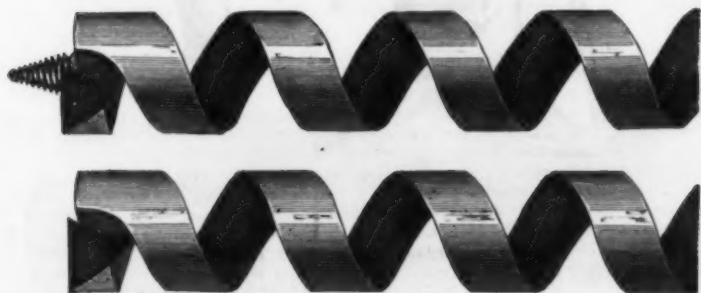
BUFFALO FORGE COMPANY, BUFFALO, N. Y.

Send for Complete Catalogue.

SNELL MANUFACTURING CO., Fiskdale, Mass.

IMPROVED SHIP AUGERS

AND
SHIP AUGER BITS.



These goods are produced from a special steel by

New and Improved Machinery.

and the labor is performed by skilled mechanics, who have made the manufacture of these goods a special study for many years, thus enabling us to place upon the market Ship Augers

Superior to Any Ever Before Made.

They are so finished as to bore endwise or with the grain as readily as across it, or through the knottiest timber without swerving.

Ship Augers of extra length twist made to order, Shanks being left in any shape or length desired.

EVERY AUGER AND BIT WARRANTED.

TENNIS & WILSON, Sole Agents,
294 Broadway, NEW YORK.

PENFIELD BLOCK COMPANY
LOCKPORT, NEW YORK.
MANUFACTURERS.

AGENCIES WITH
H.B. NEWHALL CO. NEW YORK & BOSTON.
S.H. & E.Y. MOORE CHICAGO.

WOOD AND WROUGHT IRON BLOCKS
FOR RAILROAD AND MINING WORK A
SPECIALTY. LARGEST AMERICAN MANUFACTURERS
OF WROUGHT BLOCKS. CATALOGUES FURNISHED AND
SAMPLE ORDERS SOLICITED.

THE ASBESTOS PACKING CO.



2 LAWRENCE POUNTNEY HILL, LONDON, E. C.

MINERS AND MANUFACTURERS OF ASBESTOS.

Office, 169 Congress St. BOSTON
Steam Packings,
Wick, Fiber,
Mill Board,
Flooring Felt
Cement Felting,
Pipe and Boiler Coverings,
Cloth, Yarns, &c.
BOLLING & LOWE,
General European Agents.

CRESCENT
TUBE SCRAPER
CYCLONE STEAM FLUE CLEANER
FOR HORIZONTAL AND UPRIGHT BOILERS
FROM 1/2 TO 16 INCHES
CRESCENT MANUFACTURING CO.
SOLE MANUFACTURERS
CLEVELAND, OHIO U.S.A.

John Q. Maynard Eastern Agent, 12 Cortlandt St., New York. Selig, Sonenthal & Co., Agents, London, E. C.

DUNN'S
PATENT
SAW SET
AND
GUMMER.
Four perfect sets combined in one.

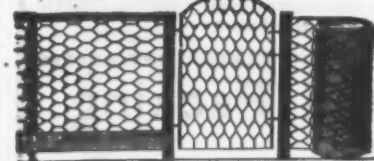
For Price Lists and Discounts, address

FLAGLER, FORSYTH & PIERSON,

MANUFACTURERS' AGENTS,

298 Broadway, New York.

Sedgwick Steel Wire Fence



Is the only general purpose Wire Fence in use, being a Strong Net-Work Without Barbs. It will turn dogs, pigs, sheep, and poultry, as well as the most vicious stock, without injury to either fence or stock. It is just the fence for farms, gardens, stock ranges and railroads, and very neat for lawns, parks, school lots and cemeteries. Covered with rust-proof paint (or galvanized) it will last a lifetime. It is superior to Boards or Barbed Wire in every respect. We ask for a fair trial, knowing it will wear itself into favor. The Sedgwick Gates, made of wrought-iron pipe and steel wire, defy all competition in neatness, strength and durability. We also make the best and cheapest All Iron Automatic or Self-Opening Gate, also Cheapest and Neatest All Iron Fence. Best Wire Stretcher and Post Auger. Also manufacture Russell's excellent Wind Engines for pumping water, or geared engines for grinding and other light work. For prices and particulars ask hardware dealers, or address, mentioning paper, **SEDGWICK BROS., M'rs., Richmond Ind.**

WE BESS
WOOD TURNING
LATHES
BANDSAW
MACHINES
THE BEST
NUT TAPPING
MACHINES

IMPROVED
PATTERN
MAKERS
LATHES
SWING
& RAILWAY
CUT OFF
SAWS
RAPID
BOLT CUTTERS
POINTERS

WOOD
BORING
MACHINERY
SLITTING
SAW
MACHINERY
ROLL
IRON CUTTERS
SEND FOR
PRICES

PURDY
MACHINE CO.
CLEVELAND
O.
PURDY
MACHINE CO.
CLEVELAND
O.
PURDY
MACHINE CO.
CLEVELAND
O.

ONE SET HOLDEN'S PATENT NEST OF SAWS.

Keyhole Blades..... \$1.50
Compass "..... 2.50
Pruning "..... 5.50
Patent Handles..... 2.50

Nests Complete..... \$12.00
DISCOUNT.....

Packed 1/4 Doz. Sets in Box.

WHEELER, MADDEN & CLEMSON MFG. CO., Middletown, N. Y.

VIRGINIA NAIL AND IRON WORKS COMPANY,

LYNCHBURGH, VIRGINIA.

NAILS and Bar Iron of Superior Finish, made exclusively from Pig Iron.



GEO. N. PIERCE & CO.,
BUFFALO, N. Y.,
New York Office, 195 Water Street.

MANUFACTURERS OF
BIRD CAGES and REFRIGERATORS.

Send for Illustrated Catalogue and Price Lists.

ALSO FOR SALE BY

Chicago Stamping Co., Chicago, Ill.
Sickles, Preston & Co., Davenport, Iowa.
Cincinnati Tin and Japan Co., Cincinnati, Ohio.
Kennedy, Spaulding & Co., Syracuse, N. Y.
Weaver & Co., Rochester, N. Y.
E. A. Burrows & Co., Troy, N. Y.

**PRESSES, DIES, AND OTHER
SHEET-METAL TOOLS**
FERRACUTE MACHINE CO.
BRIDGEPORT, CONN.

WATER.

CITIES, TOWNS AND MANUFACTORIES

SUPPLIED BY GREEN & SHAW

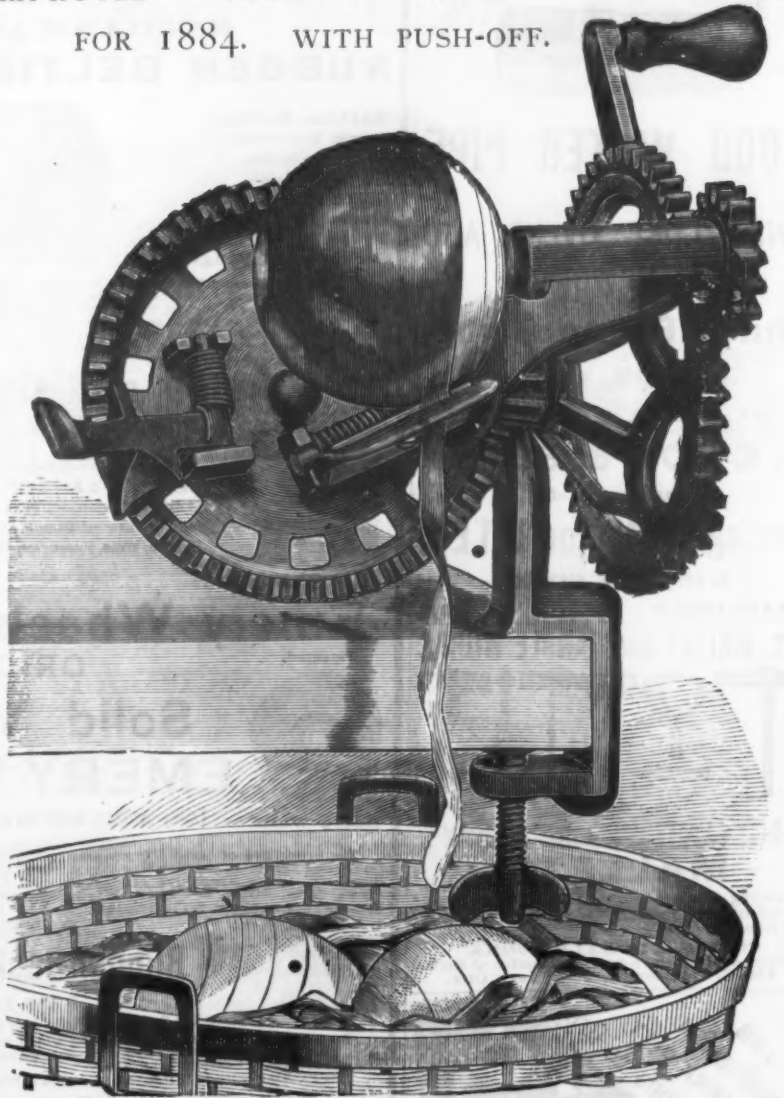
Patent Tube and Gang Well System.

WM. D. ANDREWS & BRO.,

233 Broadway, New York.

Infringers of above patents will be prosecuted.

HUDSON'S IMPROVED "ROCKING TABLE" APPLE PARER, FOR 1884. WITH PUSH-OFF.



THE LIVINGSTON HORSE NAIL CO.,

SOLE AGENTS,

104 READE STREET,

NEW YORK.



Nest of Saws



PRICES QUOTED ON APPLICATION.

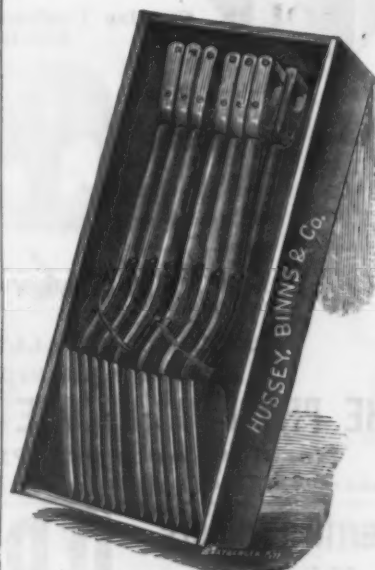
**HUSSEY,
BINNS
& CO.**

(LIMITED),

PITTSBURGH.

DURRIE & McCARTY,

NEW YORK AGENTS.



One Dozen (Box), No. 520, Opened Ready for
Sale in Store.

The Iron Age

AND

Metallurgical Review.

New York, Thursday, September 11, 1884.

DAVID WILLIAMS, Publisher and Proprietor.
JAMES C. BAYLES, Editor.
JOHN S. KING, Business Manager.

RATES OF SUBSCRIPTION, INCLUDING POSTAGE.

UNITED STATES, BRITISH AMERICA AND SANDWICH ISLANDS.

Weekly Edition.....\$4.50 a year.

Semi-Monthly Edition.....\$2.30 a year.

Monthly Edition.....\$1.15 a year.

Should be made by draft, payable to the order of David Williams on any banking house in the United States or Europe; or when a draft cannot be obtained, in postage stamps of any country.

NEWSDEALERS OR BOOKSELLERS

In 1/12 part of the world may obtain *The Iron Age* through the American News Company, New York, U. S. A., the International News Company, New York, U. S. A., and London, England; or the San Francisco News Company, San Francisco, Cal., U. S. A.

RATES OF ADVERTISING.

One square (12 lines, one inch), one insertion, \$2.50; one month, \$7.50; three months, \$15.00; six months, \$25.00; one year, \$45.00; payable in advance.

BRITISH AGENCY.

Office of THE IRONMONGER, 44a Cannon St., London.

DAVID WILLIAMS, Publisher,

33 Rende Street, New York.

PITTSBURGH.....77 Fourth Avenue.

JOS. D. WEEKS, Manager and Associate Editor.

PHILADELPHIA.....220 South Fourth Street.

THOS. HOSKIN, Manager.

CHICAGO.....36 and 38 Clark St., cor. Lake.

J. K. HANES, Manager.

INCINNATI.....19 West Third Street.

HENRY SMITH, Manager.

CHATTANOOGA.....Ninth and Carter Streets.

S. R. LOWE, Manager.

SOLE AMERICAN AGENCY FOR

THE IRONMONGER,

Published at 44a Cannon St., London.

The oldest and leading representative of the British Iron and Hardware Trades.

Subscription, Postpaid.....\$5.00

to countries outside of Great Britain, including Monthly Foreign Supplement or one copy of Ironmonger's Diary.

By a mutual clubbing arrangement between the two journals, subscriptions to both will be received by either *The Ironmonger* or *The Iron Age* on the following terms:

THE IRONMONGER AND THE IRON AGE, Weekly.

In the United States and Canada.....\$7.50 or \$1.10

In Great Britain and Ireland.....\$5.00 or 7. 12s

In other countries.....\$10.00 or 12. 6s

THE IRONMONGER, Weekly, and THE IRON AGE, Monthly.

In the United States and Canada.....\$5.75 or 23s

In Great Britain and Ireland.....\$3.25 or 12s

In other countries.....\$6.75 or 23s

The Bureau of Labor Statistics.

The President is evidently not suffering for lack of material to fill the post of Chief of the Bureau of Labor Statistics, as a recent dispatch from Washington states that there are 15 candidates awaiting his decision on their applications for the position, not including Mr. Jarrett, who was nominated by the President and confirmed by the Senate, but has never been commissioned. Two of the 15, ex-Mayor Powderly, of Scranton, and John Campbell, of Pittsburgh, are from Pennsylvania; three from New York, two from Ohio, two from the District of Columbia, and one each from Massachusetts, Illinois, New Jersey, Missouri, Maryland and Connecticut.

It is reported that the position will be filled very shortly, but we have met with no surmises as to who the favored applicant will probably be. The indications, however, are very strongly against commissioning Mr. Jarrett, although as an act of magnanimity the President would do himself much honor if he were to carry out his original intention. The fact of Mr. Jarrett's ability to be the head of this bureau is to-day unquestioned by those who are in a position to know him. The manufacturers of Pittsburgh, who for two years were thrown constantly in contact with him by reason of his position as the head of the Amalgamated Association, and who have had opportunities to know of his ability, his judgment, his fairness and his honesty, indorse him in the highest terms. The Labor Committee of the Senate, of which Hon. H. W. Blair is chairman, had Mr. Jarrett before them for two days, and they were strongly impressed with his intelligence, his fairness and his ability. Quite a number of the labor organizations of the country united in requesting his appointment, and these requests still stand. Not only that, but organizations that prefer some other candidate have joined in indorsing the nomination of Mr. Jarrett, and yet, for a reason entirely personal, the President re-

fuses Mr. Jarrett his commission, notwithstanding he has been nominated and confirmed by the Senate.

The cause of the withholding of the appointment is that, in a speech made at Pittsburgh during the heat of an intense political excitement, Mr. Jarrett is alleged to have criticised the President. Judicious men who heard the speech, while they regard it as unwise and ill-timed, do not agree that there was anything in it to which the President should have taken serious exceptions. As we have often stated, we believed, and we still believe, that Mr. Jarrett is the best man that could be found in the ranks of labor to stand at the head of this bureau, and we believe that the President could do no wiser act than to give him the appointment, which has already been too long withheld for the good of the bureau. As a gracious act of official magnanimity it would add much to the credit of an administration confessedly among the best with which this country has ever been blessed. "To err is human; to forgive, divine." If, however, there are other considerations which now influence the President, and which incline him strongly toward some one whom he deems a more suitable person for the position than Mr. Jarrett, we hope the appointment will not be much longer delayed, in order that with the assembling of the next Congress the bureau may be organized and in a fair way to do work, if it is not able to give us some reports.

The Reading Railroad Policy.

The announcement comes from Philadelphia that the Philadelphia and Reading Railroad Company and its twin, the Philadelphia and Reading Coal and Iron Company, are to be subjected to a severe pruning process. Appraisers are now engaged in examining the properties controlled by these companies, with the view of determining which of them are so unprofitable that they should be disposed of. It is intimated that some branch railroads now leased will be returned to their owners because the lessee is unable to operate them at a profit. Collieries which turn out coal at a higher cost than the net price realized are to be sold, though it is hard to understand who would buy such property in these times, except at such low rates that the purchaser could afford to let it lie unproductive till better prices ruled. Coal tracts which have not yet been developed are also among the possessions of the company marked for disposal. Many of these tracts were purchased at exorbitant figures, merely to secure them in advance of any other coal-carrying railroad company, and thus prevent encroachments upon the Reading Company's territory. But this plan failed to keep out rival companies, and the undeveloped coal lands are a source of constant financial difficulty, as they were purchased with the proceeds of bonds, the interest on which has to be regularly paid.

At Reading the company owns a large iron rail mill, which at one time did a profitable business, but low-priced steel rails have driven it into idleness. It is announced that a syndicate has been formed to purchase this mill and convert it into a Bessemer steel works. As Reading has no steel works, but is a very large iron-manufacturing center, this seems to be a step in the right direction, for the manufacture of cheap steel will some day be an actual necessity there if that city would retain its hold upon the industries it now boasts of. If such an opportunity exists for the disposal of the rolling mill, it should not be allowed to pass, for in all human probability its day of usefulness as an iron rail mill is forever gone, and the company would incur much expense in endeavoring to fit it for some other line of iron manufacture, which would in its turn yield to the encroachments of steel.

The blast furnaces controlled by the company along the line of the railroad are also indicated as proper subjects of the pruning knife. There are a number of them that have not been in operation for years, yet it is necessary to spend money on them from year to year or non-use and neglect will render them hopeless ruins. Even if they are sold for much less than they cost, it would be to the advantage of the company to dispose of them to parties who might perhaps be enabled to operate them in the near future, if they could not do so in the present condition of the iron trade. The erection of these furnaces, in most instances, was the result of an ambitious policy inaugurated by the company in the brisk times of 1870-72. At that time the outlook for the future of iron was brilliant, indeed. Pig iron sold at fabulous prices, and iron rails and bar iron were in such brisk demand that the appetite of consumers seemed insatiable. The Schuylkill Valley, to which the Philadelphia and Reading Railroad was then almost entirely confined, had but a limited number of furnaces, the Lehigh Valley far surpassing it in this respect. To equal the Lehigh Valley, and perhaps excel it, was the dream of the Reading managers. They encouraged the erection of a very considerable number of furnaces in the Schuylkill Valley, in most cases guaranteeing the payment of interest on the bonds issued by the companies organized to erect the furnaces. But the cruel panic of 1873 blasted the hopes of the Reading managers, and in the long dull period which followed they were compelled to buy in or otherwise take over nearly all the iron-manufacturing properties they had assisted to establish. Since then

a few of them have been steadily worked by parties who have leased them, but it was not possible to thus dispose of all, and the company must have steadily sunk money in this direction year after year.

As the old policy of the company has not been attended with success, an effort is now to be made in another direction, which is, we think, destined to produce good results. Having divested itself of these dead weights, and retaining such desirable properties as profitable collieries and remunerative leased railroads, there will be less necessity for the exercise of the financial shrewdness necessary to devise new obligations which will be accepted for old ones, but the simple rule of balancing receipts and expenditures will come into play. With a new outlet to the South through the Philadelphia extension of the Baltimore and Ohio Railroad, and one to the West by means of the South Pennsylvania Railroad, both of which are well under way, the Philadelphia and Reading Railroad Company will before long enjoy an increased traffic, which we hope will be profitable enough to wipe out in due course of time the obligations incurred in too generously endeavoring, single-handed, to make the Schuylkill Valley the greatest center of the iron industry in Eastern Pennsylvania.

Steel-Rail Makers and Their Workmen.

We have received a communication on the steel-rail question which takes a decidedly peculiar view of the subject of protective duties, but at the same time it is not an unnatural one for a workman to take. The communication is as follows:

To the Editor of *The Iron Age*.—SIR: The people of these United States, by their representatives in Congress, on the 3d day of March, 1883, decreed that the makers of steel rails in America should be protected by a tariff of \$17 per ton on imported rails. The debates in Congress state distinctly that this protection is for the benefit of labor.

British rails are worth \$4.15 per ton, f.o.b. The freight to New York is 7/10. The cost of imported steel rails in New York per ton is as follows:

\$4.15 at \$4.80.....	\$39.80
Freight at 7/10.....	1.25
Duty.....	17.00
Total.....	\$41.48

The latest quotations for American steel rails are \$38, \$37 and \$36.50, with the probability that the lowest of these prices has been shaded. American rail-makers are consequently selling their steel rails at from \$14.08 to \$13.48 lower than foreign rails can be laid down in any port of the United States.

It is not foreign competition they are fighting, nor can cost of production be realized at these prices, but rail-makers are combating each other for the little trade there is. This is, of course, fair business competition, the end of which will be the "survival of the fittest." But steel-rail makers, to reduce cost, have lowered the wages of their laborers, until 92 cents is said to be the price of a day's labor at some mills. Have they the right to give the wages of their workmen away in their cruel and suicidal contest?

The bounty of the American people to workmen in iron and steel works should be held sacred by the owners of these mills, and they ought to be reminded that they are giving away what does not belong to them. If tariff legislation is not to be respected in all times when it is of so much consequence to the laborer, how are you to expect him to support protective measures? When all the world is busy, each country in supplying its own wants, tariff laws are of little moment to either the workman or the mill owner.

We were at first inclined to think this an original view of the tariff question, but on reflection we believe it was presented by Mr. O. W. Potter, of the North Chicago Rolling Mill Company, at the Pittsburgh meeting of the American Iron and Steel Association in 1878. Although steel rails at that time of depression were not selling so low as they have been this fall, yet they were realizing a price far below the cost of foreign steel rails laid down here with the rate of duty added, which at that time was \$28 per ton. Competition for orders was very severe at that time, but the capacity of the steel-rail mills was not then so greatly in excess of the demand as it is now, and prices were not forced so low. The only method by which prices could then have been raised to the level of the foreign price plus the duty was through a combination of the makers, and that is the only method which could produce the same effect to-day. But a combination was regarded with disfavor then both by the manufacturers and their friends, for satisfactory reasons, and it is apparently no more in favor to-day. An effort in this direction was recently made, but the consent of all parties could not be obtained. Prices, consequently, are left to the sole operations of the law of supply and demand; and, as the supply has thus far been much greater than the demand, the prices realized have been very low. In time, however, the pendulum will swing the other way, the demand will again exceed the supply, and prices will rise.

Our correspondent's understanding of the manner in which the workingman is to be benefited by the tariff is decidedly erroneous. No duties were ever imposed by Congress in the belief that they should form a perpetual standard of value for domestic productions—that American goods should never be sold below the price of similar foreign goods plus the duty. If that were the inevitable result of protective duties, such a revenue system would exist, we fancy, for but a brief period of time. It is the boast of protectionists that their system by stimulating home competition gradually cheapens the cost of all protected articles to the consumer. The workingman is benefited in the meantime by securing employment at better wages than if he were engaged in the same vocation abroad in which his industry has been well established and prices have been reduced by sharp competition.

It is impossible, however, to regulate wages so that they will always be satisfactorily high. They will gradually fall with the increase in manufactures, the multiplication of workmen and the growth in population, being influenced favorably in seasons of an active demand for industrial products, and having a decided downward tendency when that demand ceases. Happily, there are opportunities in America for an enterprising workman to do better in some other occupation when he finds his own becoming uncomfortably crowded or barely affording him a living. Legislation can shield him from the excessive competition that would follow the throwing open of our markets to foreign manufacturers, and would thus intensify his present troubles, but it can go no further. His personal fortunes depend upon himself.

The Labor Troubles in the Mining Districts.

As was inevitable in view of the circumstances, the strike of the coal miners in the Hocking and Straitsville regions of Ohio has resulted in riot, bloodshed, the destruction of human life and the calling out of the militia to preserve order. The indications are that, unless the wisest counsels and an extremely conservative policy on the part of the miners prevail, a similar result will follow in the mines of the Monongahela River and Western Pennsylvania. The details of the riot in the Hocking Valley have been fully given to the public and need only be referred to here. An army of men, idle of their own choice, driven to desperation, with families dependent upon them, see their places filled with new men and their hope of employment cut off. In their desperation these men arm and disguise themselves and attack the guards of the mines, and, while these guards are pleading for mercy in the face of an overwhelming force, shot down in cold blood those who, like themselves, have wives and children depending upon them and who chose to work and support them rather than remain idle. It is a horrible story! One that should make the cheek of every honest workman tingle with shame. The strikers had a right to refuse to work, but the work in the mines did not belong to them, and if they chose to refuse it others had a right to do it, and the former had no right to interfere with the latter. We confess that we do not believe that the methods and relations of modern industrial life are perfect, nor all that they should be. We hope for a change in those methods and relations that shall elevate and improve the position of the workman. But it will not be brought about by masked men, by shotguns, by murder. Peace hath its victories, and the hour is near at hand when the world will be ready to listen to the arguments of earnest men who are demanding amelioration of labor, but that hour will be delayed if workmen attempt to hasten its coming by such methods as those employed by the striking miners of the Hocking Valley.

Another unfortunate feature about this strike in the Hocking Valley is that politics have been allowed to interfere in the action of the Governor in calling out the forces of the State to suppress the riot, keep the peace and protect property. It is reported that upon the first demand of the sheriff of the county for troops, Governor Hoadly ordered troops immediately to be sent to the points of disturbance, but afterward at the earnest solicitation of some of his political friends, who represented to him what the effect of such action would be upon the political prospects of his party in Ohio, he countermanded the order. To his credit, however, be it said that he immediately started for the scene of difficulty to make a personal investigation into the necessity that existed for sending troops, and as a result troops were forwarded.

At the mines of Western Pennsylvania the condition of affairs is by no means improved. Despairing of securing the service of the strikers on the terms proposed by them, the operators have decided to introduce Hungarian labor into their mines, and, to the surprise of the strikers, a large party of these people were put at work in one of the mines of the Fourth Pool. Though Hungarian labor has been introduced into mines of the Connelville region, no attempt has ever before been made to introduce it into what is known as the Pittsburgh districts, and they were unprepared for such an attempt now. The workmen of the Pittsburgh districts, especially the miners, have been very much inflamed against Hungarians for their course in the coke region, and it is difficult to predict what will be the result of the introduction of this labor into the Fourth Pool. It is reported that the "persuaders" will establish a camp near the mines in which they are at work, and compel the Hungarians either to live underground or to leave the district. In brief, the situation of affairs in the coal region of Western Pennsylvania and Central Ohio is by no means reassuring. One thing is certain—law and order must be enforced at any cost. It is only to be hoped that there will be no need of calling out the State militia in large numbers.

Hon. Charles J. Folger, Secretary of the Treasury, died at his home, at Geneva, N. Y., on the 4th inst., aged 66 years. His death occurred from a complication of diseases, comprising an affection of the heart,

hemorrhages of the lungs and disease of other organs, but it is believed by his friends that the great and controlling cause of his physical collapse was overwork. It is stated that he attempted to review in a judicial manner the vast amount of routine business which was brought to his desk from day to day, frequently prolonging his task far into the night. His defeat when he ran for Governor of New York two years ago is also credited with affecting his health. Secretary Folger is said to have been the first Secretary of the Treasury and only the sixth Cabinet officer to die while in office since the foundation of the Government. While we have had occasion to criticize some of the decisions in customs cases made by the Treasury Department during the period of Judge Folger's management of its affairs, we believed him to be thoroughly animated with a desire to do strict justice to all the interests concerned. His training as a lawyer and his judicial experience, however, inclined him to make a narrowly strict construction of the tariff laws, merely considered as statutes, without any regard whatever to the intentions of legislators or the support of a fiscal policy in favor of which the laws in question were supposed to have been drawn as plainly as the English language and the changing conditions of manufactures would allow. In this respect the traditions of the Treasury Department, it must be acknowledged, were not violated. Much interest will be felt in the selection of Judge Folger's successor, pending which the President has designated Assistant Secretary Coon Secretary *ad interim*. We trust the new head of the department, whoever he may be, will be some one thoroughly acquainted with the industries of the country, and, therefore, fully equipped to comprehend the tariff questions which may come before him for decision, as well as the financial problems connected with the discharge of the duties of the office.

Triumph of Steam over Ancient Dogma.

The remarkable manner in which current events in the far East, whether in the nature of war or famine, are being overruled in favor of a higher civilization deserve at the present time special notice. War in China, with the consequent demand for the rapid transportation of armies, and famine in the interior of India, with the obvious need of improved facilities for distributing food, alike afford an argument in favor of railroad construction which no barbaric sentiment can withstand. The Hong Kong *Herald*, in its latest issue received by mail, says: "To the embroglio with Russia China owes the extension of telegraphs; to the embroglio with France she will owe the introduction of railways." The same truth is emphasized by a Shanghai correspondent of the *London Times*, who writes as follows:

The era for railways has at length come. The effect which it will have upon the commerce of the world is incalculable. It would be to the advantage of China and foreign nations alike. With a central capital, railways in China will mean the consolidation of the Empire, the deathblow to the autonomy system, the prevention of famine and rebellion, and the best safeguard against exterior aggression. The restriction of the export of grain would be repealed, the mining industry developed, and the heavy internal taxation, the system of "squeezing," would die out gradually. It is only by this means that the country can ever be opened up, and it is only by this means that the integrity of the Empire can be assured.

If China at this moment was prepared to rapidly concentrate a military force in Tonquin, and thus overpower her adversary, she might at once retrieve the recent disaster at Fochow, and the fact is too obvious to be successfully withstood, even among those of the most exclusive and self-sufficient disposition. Recently, when Li Hung Chang, who has the credit of being the most enlightened of Chinese statesmen, urged upon the country the adoption of a railway system co-extensive with the bounds of the Empire, the proposition was brought to scorn. The fossil element of the old régime, for which the Viceroy of Nankin acted as spokesman, triumphantly reaffirmed the dogma that innovations of this character would antagonize the interests of labor and otherwise work endless mischief. It is possible that the French bombardment now enables the opponents of Li Hung Chang to look at the subject in a different light. Arguments, like fortresses, are sometimes untenable.

An economic writer in one of our leading dailies arrives at the following conclusion: The obvious cause of the unnaturally low price of wheat all over the world is the extraordinary increase in railroad and ship building within the past few years. Railroads here and in India have multiplied wheat-growing areas. The cheap ships of these days have brought the most distant acres into direct competition.

As waters in the ocean seek a uniform level, so the steam engine, represented by the locomotive and steamship, tends to equalize the distribution of all merchantable products and the prices thereof in every part of the civilized globe. The most ancient dogmas yield to its power.

The "boycotting" fever is spreading. Notwithstanding its practical failure in numerous attempted applications in the East, an effort is being made to use it as an instrument of coercion at Wheeling, W. Va. On the 4th inst. the Amalgamated Association issued a card calling upon all rail consumers to reject steel nails and leave them on the hands of the manufacturers. They assert that the iron nail is cheaper, better and in every way more suitable than

the steel nail, and denounce the latter as a direct stab at organized labor. The manufacturers have introduced it for the sole purpose, the card claims, of breaking down the association and forever subjugating iron trades unions. If the steel nail is taken up by the Wheeling mills it will throw out puddlers, heaters, rollers and laborers to the number of 3500, and put them on an already overstocked labor market. The appeal to nail consumers will probably be no more effective than the appeals of other trade representatives to buyers. If all the nails made at Wheeling were consumed in that immediate vicinity the appeal would doubtless be effectual. But by this time the Wheeling nail constituency embraces nearly every part of the United States; and a buyer in Savannah, New Orleans, Chicago or Minneapolis feels very little direct sympathy in a cause advocated by people so far away from him. Though the residents of Wheeling are very much disturbed by this new move on the part of the disaffected workmen in the nail factories, and it may deter some companies from entering into the manufacture of steel nails for the present, it is not likely that the new business will be seriously checked.

The report of the operations in the oil regions of Pennsylvania for the month of August is just at hand. As compared with July it shows a decline in the average daily production of 6343 barrels, giving a smaller yield than shown in the reports for any month this year excepting that for January, when the inclement weather retarded production. The average production per well for August was only 23½ barrels, against 59½ barrels in July. The well report for each month for the present year is as follows:

1884.	Wells completed.	Wells drilled.	Rigs up and building.	New production, bbls.	Average per well.	Dry holes.
January.....	229	270	109	3,134	13 3-5	21
February.....	227	273	173	3,051	17 1-4	10
March.....	305	268	215	4,136	19 3-4	24
April.....	298	264	205	3,678	12 2-5	26
May.....	311	244	159	5,748	18 3-4	30
June.....	328	151	69	4,634	17 1-4	37
July.....	164	123	55	9,728	59 3-10	22
August.....	144	90	59	3,833	29 3-4	37

For the last three years the August monthly reports have been as subjoined:

	1882.	1883.	1884.
Wells completed.....	350	309	144
Wells drilled.....	199	315	90
Rigs up and drilling.....	259	211	50
Dry holes.....	26	35	37
New production, bbls.....	29,044	4,207	3,833
Average per well, bbls.....	116 1-4	19 4-5	30 3-4

The price of crude oil on the first day of September ranged from 88½ to 91 cents, refined oil being reduced ¼ cent per gallon—that is, to 8 cents in New York and 7½ cents in Philadelphia and Baltimore.

The comments on the report of Mr. Henry Miller, chief engineer of the National Boiler Insurance Company, of Manchester, England, supplied by the London Engineer and published elsewhere in this issue, are well worth reading, and form a most interesting addition to an article on "British Methods of Boiler Insurance," which appeared in our columns some months ago. That there is a good deal of room for improvement over prevailing practices seems to have long been recognized, and it is simply surprising that some manufacturers should so persistently refuse to look to their own interests and expend money for inspection which they ought to know, is worse than useless, because of the insufficient price paid for it and the consequent inability to secure conscientious work from inspectors. With growing competition among inspection companies, and failure on the part of steam users to fully appreciate the value of thorough examinations of their boilers, decrease in price and corresponding decrease in reliability of the service rendered are natural and unavoidable results, and prompt measures to suppress any further tendencies in this direction cannot be too strongly urged. There is a price below which guarantee of faithful inspection cannot possibly be extended without seriously affecting the financial equilibrium of any company. What this price is, and how nearly it corresponds with what a given manufacturer is paying, is, of course, a matter of speculation, but we think that a fair estimate could be made without much difficulty, and any offer of insurance and inspection at a much lower rate should be looked upon with suspicion.

We have received a circular from the Northern headquarters of the World's Industrial and Cotton Centennial Exposition of New Orleans, located at Rooms 25 and 27, Stewart Building, Broadway and Chambers street, New York, in which the desirability of securing increased trade for the United States with Mexico and the countries of Central and South America is very plainly set forth. An array of striking statistics of the great trade of these countries with other nations is presented, and the small part our trade plays in the grand aggregate is drawn out in unpleasant contrast with the share appropriated by several European countries. The intention of the circular is to call attention to the New Orleans Exposition as a means of reaching the trade of these American neighbors of ours. It is claimed that, "in creating new outlets for our surplus manufactures, the exposition will be the most useful ever held upon this continent." Perhaps this is true, but the circular should have at the same time stated what encour-

agement the exposition managers are receiving from Central and South America. Mexico, we observe, has appropriated \$200,000 to cover the expenses of representation there, but what have the other countries done, and how is the trade of Central and South America to be affected if the residents of those countries manifest no interest in the exposition?

Newport News, situated about equidistant from Fortress Monroe and Norfolk, is coming into notice as a shipping port, particularly for grain. A steam elevator of a capacity equal to 1,600,000 bushels, and shipping 20,000 bushels, per hour, has just been completed, and five cargoes, comprising 478,000 bushels, have been loaded for Europe within a few days. In building the elevator 4500 kegs of nails and 200 tons of machinery were required; also 17,200 feet of rubber belts. By means of the Chesapeake and Ohio Railroad Newport News is directly connected with large iron furnaces in Virginia and the coal mines of West Virginia.

In the fall of 1883 A. H. Leftwich, of Lynchburg, Va., purchased on his own account from the James River Steel Manufacturing and Mining Company their iron works, situated 3½ miles above the city of Lynchburg, which he converted into a nail factory and merchant bar mill. In a very short time he put upon the market 2500 kegs of nails, and after thus demonstrating the success of his enterprise a company was organized under the name of the Virginia Iron and Nail Works, who purchased the plant and are now running it. This is one of the very few cases on record of a single individual attempting to accomplish such a result as the starting of this large establishment on a successful basis.

Negotiable Paper.

To the Editor of The Iron Age.—DEAR SIR: In the issue of The Iron Age of July 24, under the head of "Negotiable Paper," the following statement was made under "Checks:" "A check is always due on demand. It has no days of grace, and if a check is dishonored no notice of protest for non-acceptance or non-payment is necessary." During the fall of 1883 I put a furnace in a customer's house. This work, with some other, amounted to \$100. My customer, whom I shall call Smith, gave me a check on his bank for the amount. This was on Saturday morning, about 15 minutes before the mail left our place. Another mail left at six in the evening. According to my usual custom, I sent the check which I had received for this work, together with others, by express on Monday morning to the bank with which I do business. From this bank this check was duly sent to the exchange bank on Tuesday, and in due course of time it was presented to the bank on which it was drawn, when it was found that the bank had failed. The check was duly protested and was returned to me as indorser. I asked Smith for the money, stating that, although I had received his bill "Received payment by check," I had not been paid. He replied that it was my loss, and that he would never pay me another cent. I could sue him, but he would never pay. I commenced suit, and through the various lower courts I have won. The case is now on appeal in the Court of Appeals, where it may lie for years before it comes on the trial docket. Smith's counsel claims that I did not use due diligence, and that I went to a foreign State to deposit my check. The bank with which Smith does business is in New Jersey, while the one with which I do business is in New York City. His counsel claims that if I had stopped in Jersey City and presented the check at the bank on Monday I could and would have got my money. Now the question I shall put is this: Is a business man safe in taking a check from any one? What is the limit of time during which one can hold a check? I live where there is no bank, and large numbers of checks are sent to pay bills, and I, as well as others, have been in the habit of accommodating people by accepting these checks. Since the dispute with regard to the check above, I and others have been loth to take checks and have refused to cash checks as formerly, by way of accommodation, except in the case of special friends.

In reply to our correspondent we would say that it is generally safe for a business man to take checks in the course of business, provided he exercises that prudence, in regard to the solvency of the drawers for instance, which every man is expected to exhibit in his business relations. This is a matter more of discretion than of legal knowledge. As was said in the article referred to, a payment by check is not absolute payment unless so expressly agreed. If the check is not honored at the bank, it can be returned to the drawer, who is obliged to pay it. The one question to this is the case stated in the question. If the check is not presented at the bank within a reasonable time after it is received, and the bank fails, the holder of the check is the loser and the drawer is discharged. This would seem to be entirely just. The money was in the bank awaiting the presentation of the check. If the holder is so negligent as not to present it, why should he hold the drawer liable for his own negligence? The rule of law is that the check must be presented within a reasonable time, and the discussion and controversy are on the question, What is a reasonable time? This is to be determined by the circumstances of each case. There is no infallible rule. "The law on this subject," says Edwards, "is founded on the custom of merchants." If the presentation occur within the time customary with the majority of careful merchants, the drawer is not discharged. In Brady vs. Little, Miami Railway Company, 34 Barbour, 249, it was held that a delay of four days without excuse in presenting a draft payable on demand, during which delay the drawer fails, discharges the drawer. This

was the case of a bill of exchange drawn on an individual, but a check is substantially a bill of exchange, and the principle is just the same. According to the usual rule the check ought to be presented as early as the next day after its date or receipt.—4 Bingham, N. C., 268. "When all the parties reside in one place the check should be presented the same or next day after it is received; deposited in the bank, it is duly presented for payment the day after."—Hooker vs. Franklin, 2 Bosworth, 500. If a check is payable at a different place it should be forwarded the same or the next day. Negligence in presenting it will not be presumed. That is to say, that the burden of proof is on the drawer to prove that the holder was negligent.—Smith vs. James, 20 Wendell, 192. But there may be some excuse for delay, which, if proved, will be sufficient to bind the drawer, notwithstanding the apparent negligence. Thus, in Aymer vs. Beers, 7 Cowen, 705, a delay of 29 days was held to be excusable on the ground of the illness of the holder, and the drawer was not discharged. If a check is drawn with a view to circulation, and particularly if it be post-dated, as is sometimes done, a greater lapse of time will not be deemed unreasonable in presenting it.—Middleton Bank vs. Morris, 28 Barbour, 616. Moreover, if it was contemplated by the parties that the check should not be presented at once, that would be a valid excuse. On the whole, after examining all the cases, it seems to be the rule that a check should not be held without presentation for payment longer than 24 hours where the parties reside and the bank is situated in the same place. Under ordinary circumstances, even when the bank is in another place, two days at the most are all that are allowed. The only occasion that this question becomes important is on the failure of the bank, and if the bank is an old and established institution and perfectly solvent, there is very little to fear. Still, the safe method is to take the greatest degree of care.

THE AMERICAN INSTITUTE OF MINING ENGINEERS. PHILADELPHIA MEETING.

Several circumstances conspired to make last week's meeting of the American Institute of Mining Engineers one of particular interest, and those who availed themselves of the opportunity to attend the sessions and excursions spent a most enjoyable and profitable time. In response to an invitation extended by the Board of Managers of the Franklin Institute, a large number of the members and their ladies attended the opening ceremonies of the International Electrical Exhibition on Tuesday, September 2, and in the evening the first session of the Institute was held in Association Hall. Mr. John Birkinbine's preliminary remarks were followed by an address of welcome by Mr. H. W. Smith, mayor of Philadelphia, to which the president, Mr. J. C. Bayles, responded.

The address from the chair dealt rather with economic than with technical questions, considering the causes and effects of the industrial depression through which the country is passing, and urging those who stand in controlling or advisory relations to our metallurgical industries to resist, by every means in their power, the tendency to lower quality standards to meet low prices.

The first paper of the evening was on UNDERGROUND ELECTRIC CONDUITS, by Mr. C. Henry Roney, of Philadelphia, in which the methods adopted by the American and Philadelphia Sectional Electric Underground Company were described at some length. Mr. Roney alluded to the oft-quoted annoyances and dangers and the expense of overhead wires, stating, for instance, that their cost of maintenance per mile ranged between \$20 and \$30. The system introduced by the company consists in laying cast-iron pipes, composed of several sections, in the streets, from 24 to 30 inches below the pavement, providing manholes about 4 feet in diameter at the intersections of streets. The pipe is hexagonal in section, and is composed of top and bottom sections. Within the pipe are shelves dividing up the area into a number of compartments, of which each receives a number of wires. These shelves are made of wire, and their construction is such that the inconveniences of induction are avoided. The wires are drawn through from the intersection of two streets to the next, and by small hand-holes any wire can be tapped to be conducted into the houses along the line. The largest size of conduits laid, 16 inches wide by 10 inches high, has a capacity of 3000 wires and costs from \$5000 to \$6000 per mile. Such a conduit has been laid in some of the streets of Philadelphia. In Chicago there are 7 miles of a smaller size of conduit, which, embodying throughout the latest improvements, has given highly successful results. Discussing Mr. Roney's paper, Mr. N. S. Keith, of New York, spoke with approval of the methods adopted, and urged the importance of the general subject of electrical communication for mining engineers and metallurgists.

The session was closed by the presentation by Dr. Raymond of the latest decision of the law of the apex in the Sitting Bull case, Dakota. It is to be added to his former paper on the subject, in the form of an appendix.

Wednesday, September 3. The second session was held at 10 a. m., the first paper being on the DESILVERIZATION OF LEAD BY ELECTROLYSIS, by Mr. N. S. Keith, of New York. After a brief statement of the general principles involved, the author described in detail the experimental plant built some months ago at Rome, N. Y. The base bullion is melted in a reverberatory furnace of 10 tons capacity, without it appears, submitting it to any refining except skimming it. The consumption of fuel in melting 10 tons per 10 hours was stated to be one-third cord of hardwood. The lead is tapped through a spout into a valve within the furnace, running it into a series of molds hung on an annular frame on a rotating table. The molds, hinged below, are so constructed as to furnish thin plates weighing about 7.6 pounds apiece. While

casting, two copper strips are suspended in them, so that they are cast in the plate. Mr. Keith stated that the men are now sufficiently skillful at the work to cast 10 plates a minute, so that a casting capacity of 1 ton an hour is easily reached. When cool a muslin bag is drawn over them. These anodes are hung upon a frame arranged in concentric rings having between them a space of 2 inches, and holding 276 plates. The anode frame is lowered into vats about 6 feet in diameter, made of asphaltic cement and resting on a floor made of the same material. At the Rome works there are 30 of these vats, which have a capacity for depositing 1 ton in every seven days. The cathode frames are built up of 13 rings, 2 inches apart, placed concentrically, the anode frame being lowered in such a way that the rings of plates pass between two adjoining rings of cathodes, leaving a space of 1 inch between them. In the center of the frames is a space 2 feet in diameter. The vats are filled with the electrolyte, holding 600 gallons of a solution of acetate soda, in which is dissolved sulphate of lead. Scrapers to brush off the lead and prevent short circuiting pass between the anode plates and the cathodes. In order to provide for the necessary circulation of the solution, Mr. Keith has an underground system of pipes through which the solution is drawn from the vats and pumped into an overhead system of pipes which deliver it back to the vats. The current from the Edison dynamo machine passes into one vat through the center of the vat by a 1½-inch round copper conductor, and is carried to next vat after passing from anode to cathode. The dynamo has an electro-motive force at the binding posts of from 6 to 7 volts capacity, but in practice from 2½ to 3 volts is rarely exceeded. The current has been made as high as 1400 amperes, the production of lead being in exact proportion to the amperes. A current of 1000 amperes enables Mr. Keith to dissolve the lead and deposit it at the rate of from 10 to 11 pounds per hour per vat, equivalent to 1 ton per hour. The residues, which amount to about 1 per cent. of the base bullion used, are worked by melting with nitrate of soda. The second paper on

AN EXPERIMENT IN COAL WASHING, by Dr. Thomas M. Drown, described a method of separating coal from its slaty and mineral admixtures without the aid of jigging, by making use of the density of the mineral components. In the case of coal it is essential that we have a solution of a specific gravity greater than the coal, and less than the mineral or slate associated with it. Further, in order that such a solution should be particularly admissible, it must be cheap and readily obtainable. Calcium chloride fulfills all these conditions, though it is not intended to be approved in the absence of actual trial that its use on a large scale would be economically successful. The record of experiments on several samples of bituminous coal go to show that on a small scale in the laboratory the separation is easily effected and is thoroughly satisfactory. A sample of coal was crushed so that it all passed through a 20-inch sieve, and it was then treated with a calcium chloride solution of a specific gravity of 1.40. After stirring, the greater part of the fragments rose to the surface of the liquid and a portion settled at the bottom. The results were:

	Ash.	Sulphur.
Lighter portion (91.54 per cent.)	8.02	0.963
Heavier (8.46 per cent.)	50.65	1.540

It was found that the fine dust interfered with the process and prevented a prompt separation of the lighter and heavier particles. Another sample was then put in a 60-mesh sieve after having passed the 20-mesh sieve. This coal, freed from dust, gave a prompt separation when treated with the calcium chloride solution of a specific gravity of 1.30.

	Ash.	Sulphur.
Lighter portion (79.05 per cent.)	6.02	0.79
Heavier (20.95 per cent.)	29.84	2.19

The next table gives results still more in detail:

- I. Fine coal passed through 20-mesh sieve, 22.10 per cent.
- II. Retained by 20-mesh sieve, lighter than 1.35 specific gravity, 42.38.
- III. Retained by 20-mesh sieve, heavier than 1.35 specific gravity, 35.52 per cent.
- IV. Original coal (calculated):

	I.	II.	III.	IV.
Moisture.....	0.88	0.90	0.96	0.951
Volatile matter.....	19.28	19.607	16.10	18.314
Fixed carbon.....	69.37	72.16	49.70	65.567
Sulphur.....	1.01	0.897	1.58	1.351
Ash.....	9.56	6.390	31.31	15.917
Total.....	100.00	100.000	100.00	100.000
Coke.....	79.94	78.75	81.98	80.112

It will be noted from the above that the fine dust is much poorer than the original coal, and could in practice be directly added to the purified coal before coking.

Another series of analyses gave:

- I. Fine coal through 40-mesh sieve, 9.50 per cent.
- II. Retained by 40 sieve, lighter than 1.35 specific gravity, 44.60 per cent.
- III. Retained by 40 sieve, heavier than 1.35 specific gravity, 45.90 per cent.
- IV. Original coal (calculated):

	I.	II.	III.	IV.
Moisture.....	0.57	0.63	0.62	0.583
Volatile matter.....	19.97	20.31	16.37	18.550
Fixed carbon.....	68.82	72.68	61.98	62.587
Sulphur.....	1.03	0.90	1.34	1.071
Ash.....	9.61	5.53	29.75	17.144
Total.....	100.00	100.00	100.00	100.000
Coke.....	78.96	78.95	82.10	80.272

The process tried on a sample of great purity gave:

- I. Fine coal through 20-mesh sieve, 21.63 per cent.
- II. Retained by 20 sieve, lighter than 1.35 specific gravity, 76.37 per cent.
- III. Retained by 20 sieve, heavier than 1.35 specific gravity, 2 per cent.
- IV. Original coal (calculated):

	I.	II.	III.	IV.
Moisture.....	0.53	0.79	1.02	0.760
Volatile matter.....	20.11	19.84	11.50	19.730
Fixed carbon.....	75.11	75.16	66.58	75.040
Sulphur.....	0.77	0.67	4.40	0.796
Ash.....	3.28	3.54	13.44	3.704
Total.....	100.00	100.00	100.00	100.000
Coke.....	78.98	79.04	83.33	79.127

In practice the advantages of this method of purifying coal would be its promptness

and the cheapness and simplicity of the plant required for the separation. As an offset to these advantages must be put the loss of calcium chloride in the liquid adhering to the coal and slate. To determine how thoroughly this could be removed by washing, the following experiment were tried: 611 grams of purified coal were allowed to drain 15 minutes, and were then washed six times with 350 c. cm., five minutes in each case being allowed for draining. From the first washing, 21.90 grams were recovered; from the second, 3.4 grams; the third, 0.76 gram; the fourth, 0.17 gram; the fifth, 0.15 gram, and from the sixth, 0.10 gram were recovered. The lost amount remaining in the coal after the fifth washing is equivalent to 2½ pounds of calcium chloride to the ton of coal. The washing would, therefore, be a somewhat tedious process, and would require a series of large tanks. The dilute wash-waters could be used for subsequent lixiviation until they become sufficiently saturated to be still further concentrated by heat to the original density. The heat need not be here considered as an item of expense, for there is always plenty going to waste about coke-works. The effect on the quality of the coke of the small amount of chloride of calcium that would always remain in the coal would be inappreciable. The ash would be slightly increased, and perhaps there might be some sulphur volatilized; but this is not worth taking into consideration.

During the discussion Mr. John Fulton, mining engineer of the Cambria Iron Company, Johnstown, Pa., stated, on the general subject of coal washing, that experiments showed that the cost of washing preparatory to coking was 23 cents a ton, while the best coking coal, which needs no washing, can be obtained at \$300 an acre in the Connellsville district. Oswald J. Heinrich, of Drifton, Pa., insisted that the trouble with coal washing in this country, in spite of its simplicity, was that the persons in charge of such works were not generally capable of running them.

Mr. Frank Firmstone, of the Glendon Furnaces, described

A NEW CHARGING BELL which has been in successful use for several years. It is a modification of the Langan charging apparatus. During the discussion Dr. Raymond urged that the modern methods of fast driving crowded into the background the importance, formerly considered so great by blast furnacemen, of the methods of filling. Messrs. Firmstone, Cook, of Pottstown; Platt, of Waterford, and Birkinbine, quoted instances showing how great an effect upon the working of the furnace apparently unimportant changes in the construction and the dimensions of the charging apparatus may have.

A recess was taken until 2 p. m., and on reassembling Mr. A. E. Lehman gave a description of

AN IMPROVED PROTRACTOR. Having referred to a number of suggested improvements in the construction of the instrument, Mr. Lehman went on to explain their functions and utility and the advantages attending the adoption of the changes proposed. Following this Mr. John Fulton, of the Cambria Iron Company, furnished an entertaining as well as an instructive account of the methods of

COAL MINING IN THE CONNELLSVILLE COKE REGION.

He described and illustrated by means of a diagram on the blackboard the situation and outline of the basin. Mr. Fulton gave an amusing description of the old methods of mining, which he comprehended under the general term "wobbling" and pronounced sublimely independent of all those principles which governed the modern science. The old-fashioned coal wagons surprised him by their resemblance to Egyptian and Roman chariots. The miners who employed them used to work on the principle of picking away anywhere whenever they wanted a load of coal. An interesting account was given of the efforts of McConnell, Campbell and Taylor, "two carpenters and a stonemason," to sell coke for fuel in 1841 at Cincinnati. When the Cincinnati manufacturers went down to the wharf and looked at the two great arks in which a few tons of coke had been floated down the river they debated whether they had not better send the men to prison. "You can't fool us with that," said they; "do you think we don't know cinders when we see them?"

Finally, at Dayton, Ohio, the three partners met with a learned judge, who proved himself a good judge of coke, and so began the traffic that in 1874 employed 4200 ovens, and this year 10,364, in that region, which furnished over 17 per cent. of all the coke in the United States. Mr. Fulton went on to show the wasteful character of the old methods of mining, and the probable duration, despite waste, of the coal supply within the limits designated for the next two centuries, unless, indeed, the rate of consumption should be greatly increased. He spoke of the discovery that in certain places much might be saved by buying the surfaces as well as the right of running under it; he referred to the varying qualities of Broad Top, Bennington and Johnstown coke and the corresponding variations in the percentage of volatile matter, and mentioned that bituminization increased in a regular scale westward, comparing some of the lands to that agricultural region of which John Randolph said that it was very poor soil at the outset, but cultivation totally ruined it. In conclusion Mr. Fulton described the methods of propping the "roof" in the Connellsville mines.

Mr. W. Lillenberg, of New York, in a paper on

SWEDISH FIRE-BRICK, then gave an account of the method of manufacture used in Sweden. After referring to the kinds of clays in use, their properties and compositions, the author dwelt on the process of manufacture proper, describing the grinding and sifting machinery, the preparation of the pulp, and finally the burning. A paper on

QUICKSILVER REDUCTION AT NEW ALMADEN, prepared by Prof. S. R. Christy, of the University of California, and read by Dr. R. W. Raymond, was the last of the session. At 5 p. m. the members of the Institute

THE Iron Age Directory

Index to Advertisements.

Adjustable Links.	Page.	Adjustable Links.	Page.
Ewald Iron, Indianapolis, Ind.	45	Adjustable Links.	Page.
Air Compressors.		Air Compressors.	
Clayton Steam Pump Works, Brooklyn.	46	Clayton Steam Pump Works, Brooklyn.	46
Norwalk Iron Works, S. Norwalk.	46	Norwalk Iron Works, S. Norwalk.	46
Air Brakes.		Air Brakes.	
Westinghouse Air Brake Co., Pittsburgh.	4	Westinghouse Air Brake Co., Pittsburgh.	4
Alarm Money Drawers.		Alarm Money Drawers.	
Tucker & Dorsey Mfg. Co., Indianapolis.	35	Tucker & Dorsey Mfg. Co., Indianapolis.	35
Anti-Friction Metals.		Anti-Friction Metals.	
De Plaine E. A. Co., Chicago, Ill.	48	De Plaine E. A. Co., Chicago, Ill.	48
Reeves Pauls, Philadelphia.	48	Reeves Pauls, Philadelphia.	48
Arms and Ammunition.		Arms and Ammunition.	
Alford & Berkele Co., 77 Chambers, N. Y.	29	Alford & Berkele Co., 77 Chambers, N. Y.	29
Hutchinson J. W., 81 Chambers, N. Y.	10	Hutchinson J. W., 81 Chambers, N. Y.	10
Showering, Daly & Gales, 81 and 83 Cham-		Showering, Daly & Gales, 81 and 83 Cham-	
bers, N. Y.	10	bers, N. Y.	10
Smith & Co., Rockford, Conn.	30	Smith & Co., Rockford, Conn.	30
Stevens J. & Co., Chicopee Falls, Mass.	30	Stevens J. & Co., Chicopee Falls, Mass.	30
Artisan Mill Supplies.		Artisan Mill Supplies.	
Lovely John F., 102 Chambers, N. Y.	39	Lovely John F., 102 Chambers, N. Y.	39
Asbestos.		Asbestos.	
The Asbestos Packing Co., Boston, Mass.	14	The Asbestos Packing Co., Boston, Mass.	14
Chalmers-Spence Co., 419 8th, N. Y.	11	Chalmers-Spence Co., 419 8th, N. Y.	11
Asbestos Paints.		Asbestos Paints.	
H. W. Johns Mfg. Co., 87 Maiden Lane, N. Y.	32	H. W. Johns Mfg. Co., 87 Maiden Lane, N. Y.	32
Angers and Bits.		Angers and Bits.	
Jennings C. E. & Co., 90 Chambers, N. Y.	29	Jennings C. E. & Co., 90 Chambers, N. Y.	29
Tennis & Wilson, 234 Broadway, N. Y.	14	Tennis & Wilson, 234 Broadway, N. Y.	14
Axles, Springs, &c., Manufacturers of.		Axles, Springs, &c., Manufacturers of.	
Cook R. & Sons, Winsted, Conn.	13	Cook R. & Sons, Winsted, Conn.	13
Gautier Steel Dept. of Cambria Iron Co.,		Gautier Steel Dept. of Cambria Iron Co.,	
Johnstown, Pa.	34-40	Johnstown, Pa.	34-40
Liggett Spring & Axle Co., Pittsburgh.	48	Liggett Spring & Axle Co., Pittsburgh.	48
Wurster F. W., Brooklyn, N. Y.	48	Wurster F. W., Brooklyn, N. Y.	48
Axes.		Axes.	
Manly W. Jr. & Co., Lewistown, Pa.	3	Manly W. Jr. & Co., Lewistown, Pa.	3
Peck A. G. & Co., Cohoes, N. Y.	48	Peck A. G. & Co., Cohoes, N. Y.	48
Bankers.		Bankers.	
P. W. Gaultaudet & Co., 3 Wall, N. Y.	9	P. W. Gaultaudet & Co., 3 Wall, N. Y.	9
Bar Iron.		Bar Iron.	
Virginia Nail and Iron Works Co., Lynch-		Virginia Nail and Iron Works Co., Lynch-	
burg, Va.	14	burg, Va.	14
Barb Wire and Fence.		Barb Wire and Fence.	
Hais J. & Co., DeKalb, Ill.	14	Hais J. & Co., DeKalb, Ill.	14
Hais J. & Co., DeKalb, Ill.	14	Hais J. & Co., DeKalb, Ill.	14
Iowa Barb Wire Co., 98 Reade, N. Y.	2	Iowa Barb Wire Co., 98 Reade, N. Y.	2
Thorn Wire Fence Co., Chicago, Ill.	2	Thorn Wire Fence Co., Chicago, Ill.	2
Washington & Noen Mfg. Co., Worcester.	2	Washington & Noen Mfg. Co., Worcester.	2
Bellows, Manufacturers of.		Bellows, Manufacturers of.	
Bullock T. H., Cleveland, O.	8	Bullock T. H., Cleveland, O.	8
Flaccus Wm. & Son, Pittsburgh, Pa.	40	Flaccus Wm. & Son, Pittsburgh, Pa.	40
Scott Geo. M., Chicago, Ill.	30	Scott Geo. M., Chicago, Ill.	30
Bells (Steels).		Bells (Steels).	
Berlin Bros. Mfg. Co., Easthampton, N. Y.	10	Berlin Bros. Mfg. Co., Easthampton, N. Y.	10
Chapman Mfg. Co., Meriden, Conn.	10	Chapman Mfg. Co., Meriden, Conn.	10
Belted, Makers of.		Belted, Makers of.	
Alexander Bros., 412 N. 3d, Philadelphia.	30	Alexander Bros., 412 N. 3d, Philadelphia.	30
Main Belting Co., Philadelphia, Pa.	30	Main Belting Co., Philadelphia, Pa.	30
N. Y. Belting & Packing Co., 12 & 13 Park		N. Y. Belting & Packing Co., 12 & 13 Park	
Row, N. Y.	13	Row, N. Y.	13
Belt Oil.		Belt Oil.	
Post E. L. & Co., 10 Peck Slip, N. Y.	29	Post E. L. & Co., 10 Peck Slip, N. Y.	29
Bicycles.		Bicycles.	
Pope Mfg. Co., 507 Washington, Boston.	48	Pope Mfg. Co., 507 Washington, Boston.	48
Bird Cages, Makers of.		Bird Cages, Makers of.	
Jewett John C. & Sons, Buffalo, N. Y.	29	Jewett John C. & Sons, Buffalo, N. Y.	29
Lindeman O. & Co., 234 Pearl, N. Y.	3	Lindeman O. & Co., 234 Pearl, N. Y.	3
Pierce Geo. N. & Co., Buffalo, N. Y.	14	Pierce Geo. N. & Co., Buffalo, N. Y.	14
Maxwell John, 247 and 249 Pearl, N. Y.	7	Maxwell John, 247 and 249 Pearl, N. Y.	7
Bit Braces.		Bit Braces.	
Amidon & White, Buffalo, N. Y.	38	Amidon & White, Buffalo, N. Y.	38
Ives W. A. & Co., New Haven, Conn.	15	Ives W. A. & Co., New Haven, Conn.	15
Bits, Tackles, Makers of.		Bits, Tackles, Makers of.	
Bagnall & Lord, Boston, Mass.	47	Bagnall & Lord, Boston, Mass.	47
Cleveland Block Co., Cleveland, O.	42	Cleveland Block Co., Cleveland, O.	42
Detroit Block Works, Detroit, Mich.	7	Detroit Block Works, Detroit, Mich.	7
Levey J. F., 102 Chambers, N. Y.	39	Levey J. F., 102 Chambers, N. Y.	39
McGoy & Sanders, 30 Warren, N. Y.	42	McGoy & Sanders, 30 Warren, N. Y.	42
McMillan Wm. H., 113 South, N. Y.	11	McMillan Wm. H., 113 South, N. Y.	11
Penfield Block Co., Lockport, N. Y.	14	Penfield Block Co., Lockport, N. Y.	14
Blowers, Forge and Pressure.		Blowers, Forge and Pressure.	
Huyett & Smith Mfg. Co., Detroit, Mich.	34	Huyett & Smith Mfg. Co., Detroit, Mich.	34
Boiler, Compound.		Boiler, Compound.	
Crescent Mfg. Co., Cleveland, O.	14	Crescent Mfg. Co., Cleveland, O.	14
Boiler Feeders.		Boiler Feeders.	
The Miller Co., Canton, O.	46	The Miller Co., Canton, O.	46
Boilers, Steam.		Boilers, Steam.	
Babcock & Wilcox Co., 30 Cortlandt, N. Y.	12	Babcock & Wilcox Co., 30 Cortlandt, N. Y.	12
Edge Moor Iron Co., 79 Liberty, N. Y.	15	Edge Moor Iron Co., 79 Liberty, N. Y.	15
Harrison Boiler Works, Philadelphia.	40	Harrison Boiler Works, Philadelphia.	40
Boiler Plates.		Boiler Plates.	
Wm. McVail & Sons, Reading, Pa.	45	Wm. McVail & Sons, Reading, Pa.	45
The Seidel & Hastings Co., Wilmington,		The Seidel & Hastings Co., Wilmington,	
Del.	26	Del.	26
Bolt and Rivet Clippers.		Bolt and Rivet Clippers.	
Chambers, Brother & Co., Philadelphia.	4	Chambers, Brother & Co., Philadelphia.	4
Bolt Cutters.		Bolt Cutters.	
Howard Iron Works, Buffalo, N. Y.	45	Howard Iron Works, Buffalo, N. Y.	45
Sellers Wm. & Co., Philadelphia, and 79		Sellers Wm. & Co., Philadelphia, and 79	
Liberty, N. Y.	45	Liberty, N. Y.	45
Wiley & Russell Mfg. Co., Greenfield, Mass.	27	Wiley & Russell Mfg. Co., Greenfield, Mass.	27
Boring Implements.		Boring Implements.	
Ives W. A. & Co., New Haven, Conn.	15	Ives W. A. & Co., New Haven, Conn.	15
Boxes for Hardware.		Boxes for Hardware.	
Green S. H., 12 Murray, N. Y.	30	Green S. H., 12 Murray, N. Y.	30
Brackets.		Brackets.	
Penn. Hdw. Works, Reading, Pa.	15	Penn. Hdw. Works, Reading, Pa.	15
Brass, Manufacturers of.		Brass, Manufacturers of.	
Ansonia Brass & Copper Co., 10 Chif.		Ansonia Brass & Copper Co., 10 Chif.	
N. Y.	29	N. Y.	29
Bridgeport Brass, Makers of.		Bridgeport Brass, Makers of.	
Brown & Bros., 19 Murray, N. Y.	2	Brown & Bros., 19 Murray, N. Y.	2
Brown & Bros., 19 Murray, N. Y.	2	Brown & Bros., 19 Murray, N. Y.	2
David John & Sons, 101 John, N. Y.	2	David John & Sons, 101 John, N. Y.	2
Bolmes, Booth & Hayden, 35 Park, N. Y.	2	Bolmes, Booth & Hayden, 35 Park, N. Y.	2
Plume & Atwood Mfg. Co., 18 Murray,		Plume & Atwood Mfg. Co., 18 Murray,	
N. Y.	2	N. Y.	2
Rome Iron Works, Rome, N. Y.	2	Rome Iron Works, Rome, N. Y.	2
Scoville Mfg. Co., 421 Broome, N. Y.	2	Scoville Mfg. Co., 421 Broome, N. Y.	2
Waterbury Brass Co., 290 B'way, N. Y.	2	Waterbury Brass Co., 290 B'way, N. Y.	2
Brass Butt Hinges.		Brass Butt Hinges.	
Tiebout W. J. & Co., 18 Chambers, N. Y.	26	Tiebout W. J. & Co., 18 Chambers, N. Y.	26
Brass Founders.		Brass Founders.	
McFarland Wm. Trenton, N. J.	4	McFarland Wm. Trenton, N. J.	4
Reeves Pauls, Philadelphia.	48	Reeves Pauls, Philadelphia.	48
Reynolds Martin, Brooklyn, E. D., N. Y.	27	Reynolds Martin, Brooklyn, E. D., N. Y.	27
Brass Goods.		Brass Goods.	
Waterbury Mfg. Co., Waterbury, Conn.	2	Waterbury Mfg. Co., Waterbury, Conn.	2
Bridge Builders.		Bridge Builders.	
Moseley Iron Bridge & Roof Co., 5 Day,		Moseley Iron Bridge & Roof Co., 5 Day,	
N. Y.	47	N. Y.	47
Union Bridge Co., 50 Wall, N. Y.	30	Union Bridge Co., 50 Wall, N. Y.	30
Brushes.		Brushes.	
Brownell Brush & Wire Goods Co., Cin-		Brownell Brush & Wire Goods Co., Cin-	
cinnati, O.	3	cinnati, O.	3
Buckets, Pump and Elevator.		Buckets, Pump and Elevator.	
Iron Chad Mfg. Co., 28 Chif., N. Y.	48	Iron Chad Mfg. Co., 28 Chif., N. Y.	48
Builders' Hardware.		Builders' Hardware.	
Clark Mfg. Co., Buffalo, N. Y.	28	Clark Mfg. Co., Buffalo, N. Y.	28
Nimick & Brittan Mfg. Co., Pittsburgh.	38	Nimick & Brittan Mfg. Co., Pittsburgh.	38
Butcher and Shoe Knives, Manufac-		Butcher and Shoe Knives, Manufac-	
turers of.		turers of.	
Wideman John, Sheffield, England.	10	Wideman John, Sheffield, England.	10
Butts and Hinges.		Butts and Hinges.	
Smith & Edge Mfg. Co., Bridgeport.	35	Smith & Edge Mfg. Co., Bridgeport.	35
Stanley Works, New Britain, Conn.	34	Stanley Works, New Britain, Conn.	34
Union Mfg. Co., 96 Chambers, N. Y.	7	Union Mfg. Co., 96 Chambers, N. Y.	7
Car Axles.		Car Axles.	
Roberts A. & P. Co., 265 S. 4th, Phila.	5	Roberts A. & P. Co., 265 S. 4th, Phila.	5
Carriage Builders.		Carriage Builders.	
Townsend, Wilson & Hubbard, Phila.	45	Townsend, Wilson & Hubbard, Phila.	45
Carriage Hardware.		Carriage Hardware.	
E. J. Clapp Mfg. Co., Auburn, N. Y.	4	E. J. Clapp Mfg. Co., Auburn, N. Y.	4
Smith H. D. & Co., Plainville, Conn.	12	Smith H. D. & Co., Plainville, Conn.	12
Woodruff, Miller & Co., Mount Carmel.	15	Woodruff, Miller & Co., Mount Carmel.	15
Upson Nut Co., 96 Chambers, N. Y.	10	Upson Nut Co., 96 Chambers, N. Y.	10
Car Wheels.		Car Wheels.	
Union Foundry & Pullman Car Wheel		Union Foundry & Pullman Car Wheel	
Works, Chicago, Ill.	34	Works, Chicago, Ill.	34
Casters.		Casters.	
Phoenix Caster Co., Indianapolis.	35	Phoenix Caster Co., Indianapolis.	35
Castings, Iron.		Castings, Iron.	
S. Cheney & Son, Manlius, N. Y.	80	S. Cheney & Son, Manlius, N. Y.	80
Devlin Thos. & Co., Philadelphia, Pa.	7	Devlin Thos. & Co., Philadelphia, Pa.	7
Haight & Clark, Albany, N. Y.	27	Haight & Clark, Albany, N. Y.	27
Hammer & Co., Branford, Conn.	30	Hammer & Co., Branford, Conn.	30
North Brothers, Philadelphia, Pa.	5	North Brothers, Philadelphia, Pa.	5
Syracuse Nail Iron Works, Syracuse, N. Y.	5	Syracuse Nail Iron Works, Syracuse, N. Y.	5
Tatum Saml. C. & Co., Cincinnati, O.	36	Tatum Saml. C. & Co., Cincinnati, O.	36
Castings, Steel.		Castings, Steel.	
Chester Steel Castings Co., 407 Liberty,		Chester Steel Castings Co., 407 Liberty,	
Philadelphia.	48	Philadelphia.	48
Eureka Cast Steel Co., Chester, Pa.	48	Eureka Cast Steel Co., Chester, Pa.	48
Frank Stanley G. & Co., Philadelphia.	48	Frank Stanley G. & Co., Philadelphia.	48
Johnson L. G. & Co., Philadelphia.	48	Johnson L. G. & Co., Philadelphia.	48
Mackintosh, Hemphill & Co., Pittsburgh.	48	Mackintosh, Hemphill & Co., Pittsburgh.	48
Pittsburgh Steel Casting Co., Pittsburgh.	48	Pittsburgh Steel Casting Co., Pittsburgh.	48
Standard Steel Casting Co., Fairport, Pa.	6	Standard Steel Casting Co., Fairport, Pa.	6
Chains.		Chains.	
Bradley & Co., 816 Richmond St., Phila.	5	Bradley & Co., 816 Richmond St., Phila.	5
Br. H. Haskell Co., Pawtucket, R. I.	45	Br. H. Haskell Co., Pawtucket, R. I.	45
Lovely J. F., 102 Chambers, N. Y.	39	Lovely J. F., 102 Chambers, N. Y.	39
Cheese Safes.		Cheese Safes.	
National Wire & Iron Co., Detroit.	5	National Wire & Iron Co., Detroit.	5
Chemists.		Chemists.	
Haines R., Philadelphia.	5	Haines R., Philadelphia.	5
Chemicals.		Chemicals.	
Elmer & Amend, 205 Third av., N. Y.	41	Elmer & Amend, 205 Third av., N. Y.	41
Cherry Stokers.		Cherry Stokers.	
Enterprise Mfg. Co., Philadelphia, Pa.	42	Enterprise Mfg. Co., Philadelphia, Pa.	42
Chisels, Manufacturers of.		Chisels, Manufacturers of.	
Buck Bros., Millbury, Mass.	13	Buck Bros., Millbury, Mass.	13
Chucks.		Chucks.	
Ives W. A. & Co., New Haven, Conn.	15	Ives W. A. & Co., New Haven, Conn.	15
Smith & Edge Mfg. Co., Bridgeport, Conn.	35	Smith & Edge Mfg. Co., Bridgeport, Conn.	35
Specialty Mfg. Co., Cleveland, O.	39	Specialty Mfg. Co., Cleveland, O.	39
Clock Springs, &c.		Clock Springs, &c.	
Dunbar Bros., Bristol, Conn.	7	Dunbar Bros., Bristol, Conn.	7
Clothes Dryers.		Clothes Dryers.	
Hill Dryer Co., Worcester, Mass.	34	Hill Dryer Co., Worcester, Mass.	34
Coal Hods.		Coal Hods.	
Esterbrook Wm., Philadelphia, Pa.	34	Esterbrook Wm., Philadelphia, Pa.	34
Clothes Racks.		Clothes Racks.	
Ray Hubbard, Northville, N. Y.	41	Ray Hubbard, Northville, N. Y.	41
Coal, Miners of.		Coal, Miners of.	
Pardee A. & Co., 111 Broadway, N. Y.	40	Pardee A. & Co., 111 Broadway, N. Y.	40
Coal Vases.		Coal Vases.	
Jewett John C. & Sons, Buffalo, N. Y.	29	Jewett John C. & Sons, Buffalo, N. Y.	29
Coffee and Spice Mills.		Coffee and Spice Mills.	
Enterprise Mfg. Co., Philadelphia, Pa.	42	Enterprise Mfg. Co., Philadelphia, Pa.	42
Coke.		Coke.	
Schoonmaker J. M., Pittsburgh.	35	Schoonmaker J. M., Pittsburgh.	35
Colters.		Colters.	
Geo. K. Oyer Mfg. Co., St. Louis, Mo.	42	Geo. K. Oyer Mfg. Co., St. Louis, Mo.	42
Compasses & Calipers, Manufacturers.		Compasses & Calipers, Manufacturers.	
Field & Call Hardware & Tool Co.,		Field & Call Hardware & Tool Co.,	
Springfield, Mass.	10	Springfield, Mass.	10
Stevens J. & Co., Chicopee Falls, Mass.	30	Stevens J. & Co., Chicopee Falls, Mass.	30
Copper.		Copper.	
Brown & Bros., 81 Chambers, N. Y.	2	Brown & Bros., 81 Chambers, N. Y.	2
Moore & Co., 101 Chambers, N. Y.	2	Moore & Co., 101 Chambers, N. Y.	2
Pope, Cole & Co., Baltimore, Md.	2	Pope, Cole & Co., Baltimore, Md.	2
Coppy Presses.		Coppy Presses.	
Ohl Geo. A. & Co., Newark, N. J.	47	Ohl Geo. A. & Co., Newark, N. J.	47
Tatum Saml. C. & Co., Cincinnati, O.	36	Tatum Saml. C. & Co., Cincinnati, O.	36
Cordage.		Cordage.	
Elizabethport Steam Cordage Co., 48		Elizabethport Steam Cordage Co., 48	
Chambers, N. Y.	30	Chambers, N. Y.	30
Corn Huskers.		Corn Huskers.	
Graham John H., 113 Chambers, N. Y.	8	Graham John H., 113 Chambers, N. Y.	8
Corner Irons.		Corner Irons.	
Quincy Floor Plate and Staple Mfg. Co.,		Quincy Floor Plate and Staple Mfg. Co.,	
Quincy, Ill.	30	Quincy, Ill.	30
Corrugated Boiler Furnaces.		Corrugated Boiler Furnaces.	
Hartmann, Le Dux & Maeker.	42	Hartmann, Le Dux & Maeker.	42
Corrugated Iron.		Corrugated Iron.	
Collins Corrugating Co., Cincinnati.	42	Collins Corrugating Co., Cincinnati.	42
Moore & Co., Chicago, Ill.	42	Moore & Co., Chicago, Ill.	42
Moseley Iron Bridge & Roof Co., 5 Day,		Moseley Iron Bridge & Roof Co., 5 Day,	
N. Y.	47	N. Y.	47
Coverings, Boiler and Pipe.		Coverings, Boiler and Pipe.	
Chalmers-Spence Co., 419 Eighth, N. Y.	11	Chalmers-Spence Co., 419 Eighth, N. Y.	11
Cresting, Iron.		Cresting, Iron.	
Bolles J. E. & Co., Detroit, Mich.	3	Bolles J. E. & Co., Detroit, Mich.	3
Crestables.		Crestables.	
Sedell R. H., Philadelphia, Pa.	43	Sedell R. H., Philadelphia, Pa.	43
Cupolas.		Cupolas.	
Collins Furnace Co., Detroit, Mich.	43	Collins Furnace Co., Detroit, Mich.	43
Smith & Sayre Mfg. Co., 345 B'way, N. Y.	47	Smith & Sayre Mfg. Co., 345 B'way, N. Y.	47
Cutlery, Importers of.		Cutlery, Importers of.	
Alford & Berkele Co., 77 Chambers, N. Y.	29	Alford & Berkele Co., 77 Chambers, N. Y.	29
Baker Hermann & Co., 101 Duane, N. Y.	30	Baker Hermann & Co., 101 Duane, N. Y.	30
Butcher W. & S., Sheffield, England.	10	Butcher W. & S., Sheffield, England.	10
Clatworthy F. & W., 82 Chambers, N. Y.	10	Clatworthy F. & W., 82 Chambers, N. Y.	10
Curley J. & Bro., 131 & 133 Nassau, N. Y.	10	Curley J. & Bro., 131 & 133 Nassau, N. Y.	10
Cutlery, Manufacturers of.		Cutlery, Manufacturers of.	
Bannister A. F. & Co., Newark, N. J.	10	Bannister A. F. & Co., Newark, N. J.	10
Northfield Cutlery Co., Turner Falls, N. Y.	10	Northfield Cutlery Co., Turner Falls, N. Y.	10
Vought & Williams, 238 Greenwich, N. Y.	4	Vought & Williams, 238 Greenwich, N. Y.	4
Dinner Plate and Lantern.		Dinner Plate and Lantern.	
Haight Joseph, Post Chester, N. Y.	8	Haight Joseph, Post Chester, N. Y.	8
Dog Collars.		Dog Collars.	
Pope & Stevens, 114 Chambers, N. Y.	38	Pope & Stevens	

Special Notices.

RECENT BOOKS.

Hannington, Major-Gen.—The Slide Rule Extended. 40 cents.

Rensen, Ira—Principles of Theoretical Chemistry, with special reference to the constitution of chemical compounds. \$1.75.

A Boy's Workshop, with plans and designs for indoor and outdoor work. \$1.

The Naturalist's Directory, 1884; containing the names, addresses, special departments of study, &c., of the naturalists, chemists, physicians, astronomers, &c.; also a list of the scientific societies of America. \$2.

Gordon J. E. H.—A Practical Treatise on Electric Lighting. \$4.50.

Clark, Q.—Perspective Explained and Illustrated. \$1.25.

Cromwell, J. H.—A Treatise on Toothed Gearing. \$2.

Darrowsky, H.—A Practical Treatise on the Materials and Fabrication of Tiles, Glaters, Veneers, Fossils, Limestones, Cements, Pastes, Mucilage, &c.; from the German; with descriptions of the most recent American processes, by Wm. T. Brant. \$2.50.

Longridge, J. A.—A Treatise on the Application of Wire to the Construction of Ordnance. \$10.

Manton, W. P.—Beginnings with the Microscope. 50 cents.

Pettit, J. S.—Modern Reproductive Graphic Processes. 50 cents.

Thompson, S. P.—Recent Progress in Dynamo-Electric Machines. 50 cents.

Tracy, R. S., M. D.—The Essentials of Anatomy Physiology and Hygiene. \$1.25.

Wilson, E. B.—Practical Mine Ventilation. \$1.25.

Winslow, A.—Stadia Surveying; The Theory of Stadia Measurements. 50 cents.

FOR SALE BY

DAVID WILLIAMS,

88 Reade St., NEW YORK.

E. BISSELL & CO.

Wholesale Auctioneers,

Will make their next TRADE SALE of Hardware, Table and Pocket Cutlery, House Furnishing Goods, Plated Ware, &c.,

ON Tuesday, Wednesday and Thursday, Sept. 23d, 24th and 25th,

at 10 o'clock A. M., at

88 Chambers and 65 Reade Sts., N. Y.

We shall include in this sale over 20,000 dozen Table Knives and Forks, Carvers, Butcher Knives, &c., &c. Manufacturers or Importers who desire to send consignments for this sale will please forward invoices as soon as possible. Particulars in next week's issue of the Iron Age.

For Sale.

A fifteen-year lease on a Magnetic Iron Mine in Jersey, convenient to two railroads; 8-foot vein, 55 ft. ore; next to no water; machinery in perfect order; royalty on 8000 tons prepaid; terms moderate. Address "MINER."

Office of The Iron Age, 83 Reade Street, N. Y.

For Sale.

Horizontal Engine 14 x 36; Box Bed; Band Wheel 6 ft. diameter, 10-in. face; weight of large Fly Wheel about 9000 lbs.; entire weight of Engine about 14,000 lbs. Can be seen now running and in good order, delivery within a month if required. Address Box 13, station B, Jersey City, N. J.

For Sale.

Two new, first-class engines: each back-geared, screw cutting, rod-feed, power cross-feed, compound rest, full counter, friction pulleys, center rest, two face-plates, &c. One 16 foot x 26 inch, \$650. One, 16 foot x 20 inch, \$416. E. CORNISH, Manchester, N. H.

For Sale.

A Retail Hardware Store in a prominent part of Philadelphia, doing a good business. Satisfactory reasons given for selling. Address "P. O. BOX 92," Philadelphia, Pa.

Carriage Axle Plant For Sale.

This Plant is in this city, complete and new; has Kinsley and Bradley helve hammers tools made by the Pratt & Whitney and Putnam Machine Companies and a Foundry with full line of box patterns. The owners have an established business and a valuable lease of the premises on which the plant is situated, which premises are adjacent to the railroad and Erie Canal, in a locality where living is cheap and healthy. The plant will be sold reasonable, and will prove profitable to the purchaser. For particulars apply to W. F. WILSON, Assignee, 73 White Building, Buffalo, N. Y.

For Sale.

Three Leffel's Turbine Water Wheels, all in first class condition; one, 44 inches, extra heavy in all its parts. Made especially for rolling mills. Two, 15½ inches with spherical iron case. Apply to GIBBALT IRON WORKS, Reading, Pa.

GERMAN CUTLERY AND HARDWARE.

A German merchant at Remscheid (Germany), long time purchaser for a first class cutlery importing house of New York, offers to American importer or wholesale dealer to purchase them German Cutlery and Hardware at manufacturer prices against commission. Apply to "K. 266," Care of Messrs. Haasenstein & Vogler, Cologne on the Rhine, Germany.

WANTED.

Salesmen in all the States to sell Stamped, Japanese and Pined Tinware on commission. Only those who are thoroughly posted in the line and have good trade need apply between 9 and 11 a. m., or address MANHATTAN STAMPING WORKS, 505 First Ave., New York.

Special Notices.

A Rare Chance for Foundrymen and Machinists.

The G. A. Kelly Manufacturing Co., 3½ miles west of Jefferson, Texas, on the M. & P. R. R., will be sold at a bargain, as the present owners (bankers and merchants) are inexperienced in this line of business, and have not the time to devote to operating same.

Without exception, it has the finest machinery for putting up wagons, plows, &c., by steam in the South, and by an addition of patents any and all articles made of iron can be successfully made. A Furnace situated a mile from works, making Car Wheel and Foundry iron second to none.

Plows of this Company's make have a wide and established reputation, with a good trade in Arkansas, Louisiana and Texas.

There is belonging to Works 100 Acres of Land, with sufficient Houses for accommodation of employees. Situation healthy, with abundance of pure water.

Works unencumbered. Timber plentiful adjacent Works.

For further information address R. BALLAUF & CO., General Managers, Jefferson, Texas.

STEEL WORKS

AND ROLLING MILL PLANT

For Sale.

LONDON STEEL WORKS, LONDON, ONTARIO, CANADA.

Main Building of Corrugated Sheet Iron, containing 30-Ton Crucible Furnace and Gas Producer, 10-inch Train of Rolls, High Heating Furnace and Gas Producer, 100 H. P. Engine and 3 Boilers, Bradley Hammer and Shears Spring Colling Machine, Furnace, &c., Large Steam Shears, Iron Power Crane and Wheel Pits. On Molding Floor together with Core Oven and Mills, Large Wheel and Roll Turning Lathe Drill, Blacksmith Forge and Tools, Two Annealing Furnaces, &c., &c. Offers to purchase, stating terms, may be addressed to W. K. MUIR, Detroit, Mich., Or to H. E. NELLES, London, Ont.

TO WHOM IT MAY CONCERN.

IN CHANCERY OF NEW JERSEY.—Between Arthur B. Pierce, Petitioner, and The Union Bolt Works, Defendant. On petition. Notice to Creditors.

Notice is hereby given that by an order of the Chancellor of the State of New Jersey, made in this cause on the thirtieth day of August, A. D. 1884, the creditors of the said Union Bolt Works, the defendant, are required to present to the subscriber, the receiver appointed in this cause, and prove before him under oath or affirmation or otherwise, as the receiver shall direct, to the satisfaction of the receiver, their several claims and demands against the said defendant within two months from the date of said order, or that they be excluded from the benefit of such dividends as may be hereafter declared by the Court upon the proceeds of the effects of said corporation.

and in accordance with the aforesaid order, the creditors of the said corporation are hereby notified and required to present their claims and demands aforesaid, under oath or affirmation, to the receiver at his office, No. 35 Liberty Street, New York City, or at the office of John W. Griggs, 119 Washington Street, Paterson, New Jersey, within the time limited by said order. Dated September 1st, 1884. ELIAS T. DAY, Receiver. JOHN W. GRIGGS Solicitor.

Railway and Machine Shop Equipment.

New and Second-hand Machinery OF ALL KINDS.

Large Stock of Cold Rolled Shafting on Hand.

SEND FOR LISTS, TOO LONG FOR PUBLICATION.

The George Place Machinery Co.,

121 CHAMBERS AND 103 READE STS., New York.

Proposals for Ironwork for Roofs.

Office of SUPERVISING ENGINEER AND ARCHITECT, New Pension Building, Washington, D. C.

5th September, 1884.

Sealed bids are invited for building and erecting the Iron Roofs, over eighty thousand square feet, of the new Pension Building in Washington, D. C. Specifications and plans can be obtained on application in person or by letter to the undersigned.

All bids received will be opened in this office at twelve o'clock noon on the twenty-fifth day of September, 1884.

M. C. MEIGS, Supervising Engineer and Architect.

General Superintendent Wanted.

A thoroughly competent man to take charge of our mills in Fall River, Mass., for the manufacture of first class Merchant Iron and Nail. Address BORDEN & LOVELL, Nos. 70 and 71 West Street, New York City, or at the office in Fall River. Reference required. Sept. 4, 1884.

CHEMIST.

Wanted—A position as Chemist by a graduate of the School of Mines, Columbia College. Will engage in any sort of chemical or metallurgical work. Address "M. C. CULL," 230 South 5th St., Reading, Pa.

WANTED—The Foremanship of a Grey Iron Foundry.

by a Foreman understanding dry and green sand, light and heavy work. Will refer to late employers, where he was running 3000 m. lders. Address FOREMAN GREY IRON FOUNDRY, Office of The Iron Age, 83 Reade Street, New York.

AGENTS WANTED

To sell A. J. x Boiler Feeder. 25% discount. Exclusive territory given to good men. H. M. SCIPLE, 107 and 109 N. Third St., Philadelphia.

14 Agents Wanted

To sell Lubricating Oils. A very liberal commission will be paid to the right men. Apply at once to H. M. SCIPLE, 107 and 109 N. Third St., Philadelphia.

Special Notices.

Machinery, Tools, Engines and Boilers.

Second-hand. The contents of a Machine Shop.

HENRY I. SNELL, 185 N. Third St., Phila., Pa.

One Harrington Gap Lathe, swings 24 in. over shears, 36 in. over gap, with screw feed, compound rest, counter-shaft, &c., complete.

One 16 in. Blaisdell Lathe, 8 ft. bed, with screw and rod feed, change gears counter-shaft, &c.

One 16 in. Blaisdell Lathe, 22 ft. swing, 13½ ft. bed, with 14 in. chuck, compound rest screw feed, counter-shaft and pulleys.

One 16 in. Harrington Lever Drill.

One 28 in. Blaisdell Drill, with back gears, power feed and quick-return motion.

One Iron Planer, planes 7 ft. long, 12 in. wide, with cross down and angle feed, counter-shaft and pulleys.

One Iron Planer, planes 21 in. wide, 39 in. long. Counter-shaft, &c., complete.

One 21 in. Sells' Open Die Bolt Cutter, with taps and dies from 14 to 2 in.

One 12 in. Planer, planes 24 ft. long, 24 in. wide, with planer chuck, cross down and angle feed, counter-shaft and pulleys.

One Double Cylinder and Hoisting Engine. Made by Listerwood.

One 10 H. P. Portable Engine, mounted on wheels, with boiler and all attachments complete.

One 50 H. P. Corlies Engine. Built by Geo. H. Corlies. Two 75 H. P. Hor. Tubular Boilers. Built by Jacob Naylor & Co. 6 in. diameter, 16 ft. long, with 36 in. tubes, full from 2 and 1 casting and fittings in first-class condition.

One 60 H. P. Hor. Tubular Boiler, 56 in. diameter, 14 ft. long, with 36 in. tubes, with full front and fittings complete. Good order.

One 25 H. P. Hor. Tubular Boiler, 42 in. diameter, 8 ft. long, with 40 3/8 in. tubes, front and fittings complete.

One 50 H. P. Vertical Tubular Boiler.

Also a large variety of various kinds of new and second-hand machinery for wood or iron working. If you need anything please write and ask for it of

HENRY I. SNELL, 185 N. 3d St., Phila., Pa.

Rare Business Chance.

FOR SALE—All the Plant, Patterns, &c., on latest and most improved plan of a first-class Soil Pipe and Fitting Foundry. Will be disposed of on favorable terms. Address "FOUNDRY," Office of The Iron Age, 83 Reade St., New York.

For Sale.

300 Engines and Boilers, all sizes. Dull trade demands a reduction of stock.

H. M. SCIPLE, 107 and 109 N. Third St., Philadelphia.

Special Bargains in Machinery.

2 Rotary Pumps \$15 each. Steam and Boiler Feed Pumps. Bolt Cutter, 14 to 1½ in. geared, \$25. 2 Portable Hoisting Engines, \$300 and \$400. 8 H. P. Engine, \$125; 10 H. P., \$150; 12 H. P., \$160; 15 H. P., \$175; 20 H. P., \$200. Second-hand Engines, 16 to 30 in. swing; 2d-hand Planers, 6 sizes; Drill Presses, 6 sizes; Punch Presses. All practically good as new. Also full assortment New Drills, lances, Lathes, Engines, &c., &c. AMERICAN TOOL CO., Cleveland, Ohio.

For Sale.

In one of the fastest growing towns in Ohio,

A NEW, CLEAN STOCK OF HARDWARE

in a good Storeroom, with Warehouse connected Invoice from \$6000 to \$7000.

Address "HARDWARE," Cambridge, Ohio.

For Sale.

One No. 5½ Baker Blower, Nearly New.

TRENTON IRON CO., Trenton, New Jersey.

FOR SALE.

The old-established STAR CHAIN WORKS, real estate, machinery and good-will. Capacity 150 hands. Orders on hand or can be taken at once to employ 50 hands on Coil, Trace, Breast Chain, &c. Part of purchase money can remain on bond and mortgage for years.

WHITAKER & CO., Trenton, N. J.

For Sale.

One 50-foot Air Hoist for Blast Furnace, air cylinder 30 inches internal diameter, with necessary sheaves. Will hoist two barrows of stock at once. Apply to POTTSVILLE IRON AND STEEL CO., Pottsville, Pa.

FOR SALE.

Three Lathes, 3 Planes, 5 Drills, Shaper, Milling Machine, Sensitive Drill, Emery Grinder, Foster Crusher, Bogardus Mill and Mixer.

A. G. BROOKS, 261 N. 3d St., Phila.

LAMBERSON'S

COPYRIGHTED

Hardware Price Book.

Pocket Edition. 240 Pages. Revised and Improved, 1884. One copy, \$1.00; three copies, \$1.50; six copies, \$2.00. NOW READY for delivery, post-paid, to any address on receipt of price by H. LAMBERSON, Portland, Oregon, or David Williams (or Iron Age), 83 Reade St., N. Y.

HARDWARE MANUFACTURERS.

An experienced man, personally acquainted with the Jobbing Hardware and Heavy Hardware Trade from Chicago to Salt Lake City, wishes the agency at Chicago for some first-class Eastern manufacturer. Address P. O. Box 316, Chicago, Ill.

Wanted.

WROUGHT AND CAST TURNINGS, IN CAR-LOAD LOTS.

Address, stating quantity, condition, price, &c., SITES & GILL, 222 and 224 So. Third St., Philadelphia, Pa.

A. W. WHEELER,

WHOLESALE HARDWARE, 141 LAKE STREET, CHICAGO, SEPT. 1, 1884.

Being desirous of retiring from business, will from this date commence to sell out my entire stock of Hardware, Cutlery, Stamped and Pined Tinware, Nails, &c.

A. W. WHEELER.

WANTED.—A gentleman thoroughly posted

in the Hardware business in all its branches desires a position in which he can utilize an extensive experience to the best advantage. He is well acquainted with the trade, and can furnish unexceptional references as to character and ability. Address "A. B. S.," Office of The Iron Age, 83 Reade St., New York.

Special Notices.

New & Second-Hand Machinery.

NEW.

1 Engine Lathe 10 in. x 3½ ft.

1 each, Engine Lathes, 11 in. x 4 and 5 ft.

1 Engine Lathe 14 in. x 5 ft. and 5 ft.

1 each, Engine Lathes, 16 in. x 5 ft. and 5 ft.

1 " " 20 in. x 8, 10, 12, 14 and 16 ft.

1 " " 22 in. x 8, 10, 12, 14 and 16 ft.

1 " " 24 in. x 8, 10, 12, 14 and 16 ft.

1 " " 26 in. x 8, 10, 12, 14 and 16 ft.

1 " " 28 in. x 8, 10, 12, 14 and 16 ft.

1 " " 30 in. x 8, 10, 12, 14 and 16 ft.

1 " " 32 in. x 8, 10, 12, 14 and 16 ft.

1 " " 34 in. x 8, 10, 12, 14 and 16 ft.

1 " " 36 in. x 8, 10, 12, 14 and 16 ft.

1 " " 38 in. x 8, 10, 12, 14 and 16 ft.

1 " " 40 in. x 8, 10, 12, 14 and 16 ft.

1 " " 42 in. x 8, 10, 12, 14 and 16 ft.

1 " " 44 in. x 8, 10, 12, 14 and 16 ft.

1 " " 46 in. x 8, 10, 12, 14 and 16 ft.

1 " " 48 in. x 8, 10, 12, 14 and 16 ft.

1 " " 50 in. x 8, 10, 12, 14 and 16 ft.

1 " " 52 in. x 8, 10, 12, 14 and 16 ft.

1 " " 54 in. x 8, 10, 12, 14 and 16 ft.

1 " " 56 in. x 8, 10, 12, 14 and 16 ft.

1 " " 58 in. x 8, 10, 12, 14 and 16 ft.

1 " " 60 in. x 8, 10, 12, 14 and 16 ft.

1 " " 62 in. x 8, 10, 12, 14 and 16 ft.

1 " " 64 in. x 8, 10, 12, 14 and 16 ft.

1 " " 66 in. x 8, 10, 12, 14 and 16 ft.

1 " " 68 in. x 8, 10, 12, 14 and 16 ft.

1 " " 70 in. x 8, 10, 12, 14 and 16 ft.

1 " " 72 in. x 8, 10, 12, 14 and 16 ft.

1 " " 74 in. x 8, 10, 12, 14 and 16 ft.

1 " " 76 in. x 8, 10, 12, 14 and 16 ft.

1 " " 78 in. x 8, 10, 12, 14 and 16 ft.

1 " " 80 in. x 8, 10, 12, 14 and 16 ft.

1 " " 82 in. x 8, 10, 12, 14 and 16 ft.

1 " " 84 in. x 8, 10, 12, 14 and 16 ft.

1 " " 86 in. x 8, 10, 12, 14 and 16 ft.

1 " " 88 in. x 8, 10, 12, 14 and 16 ft.

1 " " 90 in. x 8, 10, 12, 14 and 16 ft.

1 " " 92 in. x 8, 10, 12, 14 and 16 ft.

1 " " 94 in. x 8, 10, 12, 14 and 16 ft.

1 " " 96 in. x 8, 10, 12, 14 and 16 ft.

1 " " 98 in. x 8, 10, 12, 14 and 16 ft.

1 " " 100 in. x 8, 10, 12, 14 and 16 ft.

1 " " 102 in. x 8, 10, 12, 14 and 16 ft.

1 " " 104 in. x 8, 10, 12, 14 and 16 ft.

1 " " 106 in. x 8, 10, 12, 14 and 16 ft.

1 " " 108 in. x 8, 10, 12, 14 and 16 ft.

1 " " 110 in. x 8, 10, 12, 14 and 16 ft.

1 " " 112 in. x

Ap[ro]pos of the efforts now being made to develop trade with the Congo region, the following item from the *Boston Traveler* will be read with interest, although it is not strictly speaking a hard ware item: One hundred and fifty thousand gallons of New England rum, the largest invoice of this kind of spirits ever shipped from the United States, was recently cleared for the coast of Africa.

Trade Report.

Philadelphia.

Office of The Iron Age, 220 South Fourth St.,
Philadelphia, September 9, 1884.

Pig Iron.—A slight improvement in the demand is reported, but in all essential features the market is unchanged. Stocks have been allowed to run down to the lowest point possible, and a general replenishment is in order at this season. There is nothing to indicate any increase in consumption or any decrease in supply, but contracts recently expired are being renewed, and in many cases will be made to extend over the balance of the year. Good brands are in only very moderate supply, and the tendency is to decrease rather than increase it. Prices are unchanged, although, with more business under way, sellers are naturally less disposed to grant concessions. So far as can be seen, the present condition of things is likely to continue for some time to come, followed, perhaps, with greater activity and better prices, whenever there is a change, which, however, is not very probable during 1884. The wide range of prices referred to in recent reports is still a prominent feature, choice brands being held pretty much as they were five or six months ago, while other descriptions have "sagged off" little by little, until they are easily from \$1 to \$1.50 lower than they were during the early spring months. Some think that this is offset by a depreciation in quality, inferior material being used, so as to cheapen cost. Whatever may have been the cause, there is no doubt of the fact that low-priced Irons are not easily marketed, while really first-class brands, within certain limits, can be readily placed at steady and uniform prices. The majority of sales have been at from \$19.50 to \$20 at tide for No. 1 Foundry, \$20.50 to \$21 for choice brands, and from \$18.50 to \$19 for brands that are comparatively new or unknown. Mill Irons show a similar disparity, low grades being available at from \$16 to \$16.50; standard brands at \$17 to \$17.50, and a few choice makes \$18, f.o.b. cars at furnace. The extreme figures at both ends are quite exceptional, but, in order to define the market clearly, they require mention. The great bulk of business, however, is done at medium figures—say \$19.50 to \$20 for No. 1 and \$17 to \$17.50 for Mill Irons. No. 2 Foundry is dull and irregular; sales chiefly at \$18 to \$18.50, but on large lots sellers are disposed to make liberal terms, as the supply is somewhat large.

Foreign Iron.—Demand shows no improvement, the only articles asked for being Ferromanganese, for which \$73.50 is quoted for 80%, and Speigleisen, which is wanted in 1000-ton lots and offered at about \$27 for 20%.

Muck Bars.—There is some inquiry, but bids are very low; sales chiefly at \$29 to \$29.50 at mill, although large buyers expect to place their orders at less money.

Blooms.—There is no change to notice, the demand being irregular and sales at prices according to quality. Inferior makes can be had at low prices, but for the best the asking prices are as before, viz.: Charcoal Blooms at \$53 to \$55; Run-out Anthracite, \$43 to \$45; Scrap Blooms, \$40 to \$42; Northern Ore Blooms, \$38 to \$40.

Bar Iron.—There is the usual demand for small lots, but large orders are few and far between. As a matter of fact, there has been no perceptible change in the condition of the market for many weeks past, and, so far as can be seen, there is nothing to indicate the probability of change for some time to come. Manufacturers complain of low prices and inadequate demand, but as a rule they secure enough to keep their men employed; but to accomplish that requires close watching, and in some cases a little shading in prices. Nominally, the rates are 1.0¢ for Best Refined Iron and 1.7¢ at 1.75¢ for medium quality, but on good-sized orders business has been done at less money.

Plate and Tank Iron.—The market shows no change, the demand being for small lots exclusively. On this class of trade the mills are tolerably well employed, although business is of such a hand-to-mouth character that there is no certainty how long it will continue. No large orders are in sight at the moment, and competition is so strong that prices have in some cases been shaded quite sharply. Ordinarily, quotations are about as follows: Plate Iron, 2.1¢; Tank, 2.15¢ to 2.25¢; Shell, 2.75¢; Flange, 3.75¢; Fire-Box, 4.25¢.

Structural Iron.—Business in this department is exceedingly dull, no new business of importance having been on the market for some time past. The mills are running full in some of their departments, but there is nothing like general activity, and from present appearances very little prospect for improvement in the near future. Prices are nominally unchanged, but on large lots concessions would doubtless be made from the asking rates, which are as follows: 2.1¢ for Angles, 2.25¢ for Bridge Plate, 2.75¢ for T's and 3.5¢ for Beams and Channels, subject to the usual discount on large lots.

Sheet Iron.—There is rather more business doing, and, owing to the excessive heat, the mills are not turning out as much as usual, so that there is a temporary scarcity of some numbers. Prices are steadier, although on large orders there is no difficulty

in obtaining the usual concessions. Small lots are quoted about as follows:

Best Refined, Nos. 26, 27 and 28.....	4 ¢
Best Refined, Nos. 18 to 25.....	3 1/2 ¢
Common, 1/4¢ less than the above.....	6 ¢
Best Bloom Sheets, Nos. 26 to 28.....	6 ¢
Best Bloom Sheets, Nos. 22 to 25.....	5 1/2 ¢
Best Bloom Sheets, Nos. 16 to 21.....	5 1/2 ¢
Common Red Plates, 3-16 to 16.....	2 1/2 ¢
Blue Annealed.....	2 1/2 ¢
Best Bloom, Galvanized, discount.....	50 ¢
Second quality, discount.....	50 ¢
Common, discount.....	50 ¢

Wrought Iron Pipe.—The demand shows some improvement, owing to the approach of the fall trade and the usual requirements for steam heating purposes. Buyers are not taking stock lots, however, but confine their purchases to what is needed for immediate use. Prices are very irregular and it is impossible to give exact figures, there being virtually an open market. Under these circumstances discounts are purely nominal as previously quoted, viz.: Butt-Welded Black Pipe, 30%; Butt-Welded Galvanized, 20%; Lap-Welded Black, 50%; Galvanized, 35%; Boiler Tubes, 47 1/2%.

Steel Rails.—Inquiries for large lots still continue, and manufacturers are beginning to feel like advancing prices. A very large amount of business has been taken at \$27 at mill, and offers that are out to sell at same figure will no doubt be accepted within a few days. In some cases a slight advance is asked, and there is reason to believe that the tendency will be gradually toward higher figures. There is plenty of room for orders yet, and manufacturers are not likely to refuse offers from good parties at \$27 to \$27.50, but there is no such anxiety for business as there was a few weeks ago.

Crop Ends.—Demand light, but sellers are anxious for bids. Foreign Crops are offered for shipment at \$20 to \$21, but it is difficult to arouse interest in the market at present.

Old Rails.—The demand seems to have died out again, and there is very little disposition to do business at present prices. Sellers ask \$19, Philadelphia, for spot lots; and lots on the line of road at various points in the interior could be had at about same figure, but buyers seem comparatively indifferent at over \$18.

Scrap Iron.—Market dull and uncertain. Sales of Foreign Scrap have been made at \$19 to \$19.50, and choice American at \$20 to \$20.50; Wrought Turnings at \$15; Machinery Scrap \$15, and Cast Turnings, \$9 to \$10.

Nails.—There is a slight increase in demand, but otherwise the market shows no change. Prices remain about as last quoted, although they are irregular, and there are rumors of lower figures in exceptional cases. However, the general selling rate continues to be about \$2.20, with \$2.15 to \$2.30 as the outside figures.

Pittsburgh.

Office of The Iron Age, 77 Fourth Avenue,
Pittsburgh, Pa., September 8, 1884.

The general Iron business remains unchanged; operators, both in the raw article and the finished product, continue to report trade as being exceedingly dull for the season, and the prospect for an improvement soon is not as promising as it might be, although there is sometimes a change for the better when least expected. In addition to the dullness, prices have been cut to such an extent that only those having all the latest appliances and improvements, and thereby enabled to reduce the cost of production to the lowest possible limit, are enabled to realize a new dollar for an old one in the present condition of affairs.

Iron Ore.—The Ore trade continues exceedingly dull and depressed, and no change for the better need be looked for while there are so many idle blast furnaces.

Pig Iron.—Commission men all agree in reporting an exceedingly dull market, with but little prospect of any decided or immediate improvement. But a small portion of the puddling furnaces are working double turn. Some are cold, the majority working half-time, and the consumption is light in consequence. While admitting that Pig Iron is low and that there is no money in it at present prices to the furnacemen, consumers claim that relatively it is bringing fully as much as, if not more than, the products, and it would appear, therefore, that in this most important respect the one has but little advantage over the other. Scarcely a week elapses but what a furnace or two is reported as having blown out, and production is steadily being reduced, which, in connection with a very small stock in the hands of consumers, is favorable to the furnaceman. Prices remain unchanged; furnacemen say that hard-pan has been reached, and they are refusing to make any further concession. We quote ruling prices as follows:

Neutral Mill.....	\$15.00 to \$16.50, 4 mos.
White and Mottled.....	15.00 to 15.50, 4 "
No. 1 Foundry.....	19.00 to 20.00, 4 "
No. 2 Foundry.....	17.50 to 18.00, 4 "
Silvery, as to quality.....	18.00 to 19.00, 4 "
All-Ore Mill.....	17.00 to 18.00, 4 "
Cold Blast, Charcoal.....	25.00 to 28.00, 4 "
Bessemer Iron.....	18.50 to 19.00, 4 "

There was a sale recently of Bessemer Iron at \$18.20, cash, the lowest point which it has yet touched.

Muck Bar.—There have been no sales reported for some time, in the absence of which we continue to quote at \$30, cash.

Manufactured Iron.—The general Merchant-Iron trade continues dull and very unsatisfactory; not only is the demand unusually light for the season, but prices are unremunerative. We continue to quote first-class Iron at 1.65¢ to 1.75¢ for Bars, according to character of order. Poor stock is being sold on a lower basis than that quoted. Some of the mills are fairly employed on Skelp Iron, which is still quoted at 1.75¢ to 1.8¢. Wm. Clark & Co. have started up on Cotton Ties, and it is understood that Painter Sons will follow shortly. England has had the Cotton-Tie trade for a number of years, but the cost of production here has been reduced to such an extent that American manufacturers have been enabled to wrest it from the English. It is understood that at the price the English received they made no money, and, if so, they lose nothing in parting with it.

Nails.—The Nail trade continues slow and unsatisfactory for the season. This is usually one of the best months of the year, but thus far it has shown no signs of improvement. Some manufacturers report an increased inquiry, but orders are mostly small, and it is evident jobbers are still impressed with the belief that the lowest point has not yet been reached. We continue to quote at \$2.10, 60 days, 2¢ off for cash, in carload lots, and 5¢ at 10¢ per keg additional in a jobbing way. Intimations prevail of sales being made at lower prices than those quoted, but they are not well authenticated; manufacturers here all give \$2.10 as the bottom price.

Wrought Iron Pipe.—There is a fair business, but it is mainly local and occasioned chiefly by the putting down of natural-gas wells; after the gas is found miles of Pipe are wanted to convey the same from the wells to points of consumption. One company contracted recently for 40 miles of Pipe. Prices are quoted as follows: Discounts on Black Butt-Welded Pipe, 40%; Galvanized do., 35%; on Black Lap-Welded Pipe, 60%; on Galvanized do., 45%; 2-inch Oil-Well Tubing, 12¢ per foot, net; 5 1/2-inch casing, 40¢ per foot net.

Steel Rails.—A firmer and better feeling appears to prevail, which may be attributed to the growing belief that hard-pan has been reached. So far as we can learn, there have been no sales here under \$28, cash, at mill, but they have been sold east of Pittsburgh at equal to \$27 here, which is all probably that could be obtained for a round lot.

Old Iron Rails.—We are reported a sale of 1000 tons at \$20 here, and we learn of a sale for delivery at Youngstown at \$19.50. We hear of a bid of \$19.50 for a large lot for future delivery.

Crop Ends.—The last sale reported of (American) Steel Rail Ends was at \$18.25, cash, which appears to be the ruling price.

Steel.—The Merchant Steel trade continues dull for the season, and prices are weak, but unchanged. Standard brands Refined Cast Steel, 9 1/4¢ to 9 1/2¢; Crucible Machinery, 5¢ to 5 1/2¢; Open-Hearth and Bessemer do., 3¢.

Railway Track Supplies.—The combination price for Spikes remains unchanged at 2.35¢, 30 days, but they are being sold for considerably less. Splice Bars still quoted at 1.65¢ to 1.75¢, and Track Bolts, 2 1/2¢ to 2 3/4¢.

Scrap.—Wrought Scrap quoted at \$18 to \$19 per ton net for Ordinary and \$20 for Selected; Old Car Axles, \$25 to \$28; Cast Boring, \$12 to \$12.50, gross; Old Car Wheels, \$16.50 to \$17, gross.

Window Glass.—Trade is reported as growing better, and the outlook is considered favorable for at least a fair business during the remainder of the present year. Prices unchanged.

Chicago.

Office of The Iron Age, 36 and 38 Clark St.,
Cor. Lake St., Chicago, September 8, 1884.

Hardware.—During the week under review there has been no change of importance in the Hardware market. Jobbers are having a steady demand for all goods of a seasonable character, which brings their trade in bulk up to, if not beyond, the maximum of a year ago. Purchases are made in accordance with present and prospective consumption, and clearly show the rising tide in business. Now and then we hear the mutterings of the despondent members of trade, who are greatly in the minority, but these originate more from the decline in the profit column of the balance sheet than from the limit in demand. Entire satisfaction can hardly be expected. The extreme warm weather has had some influence upon the week's business, but, as this is likely to soon end, there is nothing from which to gather gloomy forebodings. Changes in prices are usually downward, but in such a limited degree that they amount to a small item to either buyer or seller.

Barb Wire.—There appears to be a steady increase in the demand for Barb Wire. From this it will not be understood, however, that there is much of a business doing, but that each week slightly increases the demand, which has been very slow during the summer months. Prices on carload lots are frequently called for, but the difference in quotations from the manufacturing centers dispels the intention to buy except where necessity requires it. On Galvanized 5 1/4¢ is quoted as a market price in car lots, and 4 1/4¢ on Painted. Smaller lots command from 1/4¢ to 1/2¢ additional.

Nails.—The demand for Nails is not as strong for the first week in the month as was expected. A general impression prevailed that September would bring a reaction in the Nail market, but in this all are disappointed at the outset. The market is neither stronger in price nor demand. The

stock of Nails has not diminished with the rapidity that was expected, and makers are not in much better shape than they were two months ago. Most of the mills are either idle or working on part time, and prices are low and shaky. During the week carload lots were sold at \$2.20, 2¢, 60 days, on distinct orders, but when the order embraced a line of other goods these figures were not refused on less quantities, and, rumor has it, were discounted in car lots. In small lots the price varies according to circumstances, with \$2.25 to \$2.30 quoted as market price.

American Pig Iron.—Agents of furnaces, makers of Pig Iron, and jobbers, all unite in the expression of improvement in the Pig Iron market. They claim that they have attained the position where their demands must be acceded to or the Iron be left in the yards or not made. Concessions on quotations are less frequently made and underbidding is in bad repute. The position of the market thus characterized is based upon two points: That Iron cannot be made at lower prices; that present and better prices can be had by simply refusing to sell for less. To this end Charcoal furnaces are curtailing their production. To the list of suspended furnaces will soon be added the Pioneer, which, a well-authenticated rumor says, will blow out and wait for higher figures. Under the improved tone of the market, trading in carload lots is rather more free and contractors more ready to meet the demands of sellers. There are yet many buyers who have not made their usual arrangement who would willingly accept terms that were offered them several weeks ago and cannot now be had. We are informed that the bulk of Iron sold within two weeks would make an average increase of 200% over that of 60 days ago. We noted a week ago the prospect of an advance. While there is no change in open quotations, there has been a lopping off of some concessions (25¢) which were offered then, and the price brought that much nearer to the figures quoted, which is virtually an advance on the inside price. In Southern Iron the market is steady and quotations firmly supported for good brands. Coke Irons have not been disturbed to any extent and are in lighter demand than the other grades mentioned. Soft Irons are not strong in price and exist in numerous quality. We make the following quotations for carload lots, four months: Lake Superior Charcoal, Nos. 1, 2 and 3, at \$21 to \$21.50; Nos. 4, 5 and 6 at \$22; Lake Superior Coke at \$20; Lake Superior and Ohio, mixed, at \$20 to \$21; Ohio Standard Black Band, No. 1, at \$21; Southern, No. 1, at \$18; No. 2 at \$17; Silvery Soft at \$17.50 to \$19.50; Anthracite, No. 1, at \$21, and No. 2 at \$20; Bessemer Pig, \$18.75.

Scotch Pig.—The market for Scotch Iron is fairly active, considering the limited channels of its use. Much more Foreign Iron is being taken for softening purposes this season than last year. Stocks are not very heavy, and the slow sale that has attended this Iron during the past year has heretofore discouraged its importation. There is no change in price, and we make the following quotations: Summerlee, \$25.50, cash, from yard, and \$24.50 to arrive; Glengarnock, \$25.50 from yard, and \$24 to arrive.

Merchant Steel.—There is nothing new in the market for Merchant Steel. A fair business is doing in the higher grades, but a constant kicking is in process on price. Some makes, such as the "Crescent" brand, cannot be had at prices named by other makers. Buyers of Steel have a large supply of stock to select from and can find a quality to suit almost any price. From appearances there is less cutting among manufacturers of similar grades; for instance, Tool Steels of the Best Refined qualities are held more firmly within a certain limit. When the price does not suit the purchaser, he seeks for a brand of less note and buys it for less money, and thus through the entire line quality divides the trade. Syndicate Plow Steels are still quoted at 7¢ to 7 1/2¢, and no change in the status of the makers, so far as could be ascertained. For refined grades from store we make the following quotations:

Best Refined Cast Tool Steel.....	9 ¢ @ 10¢
Crucible Cast Machinery Steel.....	6 1/4 ¢ @ 6 1/2 ¢
Open-Hearth Machinery Steel.....	5 1/4 ¢ @ 5 1/2 ¢
Bessemer Machinery Steel.....	5 ¢ @ 5 1/2 ¢
Open-Hearth Spring Steel.....	5 1/4 ¢ @ 5 1/2 ¢
Tool-Cut Steel.....	5 1/4 ¢ @ 5 1/2 ¢
Bessemer Steel.....	5 ¢ @ 5 1/2 ¢
Fire-Box and Boiler Steel.....	5 ¢ @ 5 1/2 ¢

Steel Rails.—There is no information to be had regarding the market for Steel Rails in this city. Makers will not express themselves on future events, and the figures at which they take orders are closely guarded. There is reason to believe that some contracts are being made, but at what figures or in what quantities cannot be discovered. It is given out by good authority that \$30 is about as low as small orders could be placed at present, but the conditions, nevertheless, depend upon the circumstances and position of the mill.

Old Rails.—Several lots aggregating about 10,000 tons changed hands during the week. We quote \$17.75 Chicago and \$18.35 Milwaukee delivery as the market price.

Structural Iron.—This class of trade is in about the same condition as a week ago. New orders are falling off, and store trade coming from small buildings only. There is nothing in view at present that will change this aspect. We continue the following quotations, with 1/4¢ to 1/2¢ added for delivery from stock: Beams, \$3.60; Channels, \$3.60; T Iron, \$3; Angle Iron, \$2.50; Flitch Plates, \$2.50; Frieze Plates, \$2.70.

Bar Iron.—Business continues fairly active for New Puddled Iron. The demand varies very little from week to week from large buyers throughout the country, and the smaller trade is fully up to expectation. Within the last two weeks there has been a slight change in price to the small consumer, which now places him almost on a par with carload buyers, to whom there has not been any increased advantage. When taken from the enormous stock carried by the jobbing houses there is very little extra expense in handling small lots, and for the benefit of this class of consumers Messrs. Jones & Laughlins have reduced their price to within a fraction of that at which carload orders are placed. We quote from store: For Best Refined New Puddled Iron, \$1.85 to \$1.90, which is about 5¢ off of former prices. Common Iron continues in fair request and weak in price. Quotations are made from mill at \$1.55 to \$1.70, according to the disposition of the maker. From store, \$1.75 to \$1.80 is quoted.

Norway Bars.—The new importations of Swedish and Norway Irons are fast disappearing. Many of the country merchants have been waiting the advent of a new stock, and since it has come, and with it a reduction in prices, business has been quite brisk. Merchant trade price is 3.75¢, J. & L.'s new list, and 4¢ rates to consumers.

Galvanized Iron.—Trade in this class of Iron is considered fairly good for the season. The finishing up of buildings has strengthened the demand that had become rather slow a month ago. Cornice-makers are taking more Iron now and in larger lots than was anticipated, and in this particular size mills are kept very busy, and in some cases have difficulty in filling orders within the required time. The following are jobbers' quotations: Juniata, 52 1/2¢ off; Charcoal, 55¢ off, and Refined, 57 1/2¢ off.

Black Sheets.—The demand for Black Sheet Iron grows stronger each week, and the stock of the jobber weaker. Makers are not quite as firm in their price as a week ago, and in all probability the jobbers will buy much of their winter's supply very soon. As yet there is no change in price from store, and the consumer who needs Iron is reaping the benefit of prices, which are still lower than the price asked by makers. We continue the following quotations, which are subject to shading in accordance with the balance of an order for other goods: Nos. 10 to 14 at \$2.60 to \$2.70; No. 24 at \$3; Nos. 25 and 26 at \$3.10, and No. 27 at \$3.20.

Old Wheels.—The market is somewhat overstocked with Wheels. Foundries are bidding about \$17 for such as they want. A market price for any quantity would be a shade less. Holders are pressing sales in hope of better figures.

Scrap Iron.—The low price of Common Bar Iron holds the price of Scrap a few points lower than suits the dealers who have large stocks on hand that were accumulated when prices had a higher range. Mills quote \$15.50 to \$16 for No. 1, and \$11 to \$12 for No. 2, Chicago or Milwaukee delivery. We make the following quotations as dealers' purchasing prices: No. 1 Wrought Scrap, 1/2 net ton, \$15; Cast Scrap, 1/2 net ton, \$12; No. 1 Stove-Plate Scrap, 1/2 net ton, \$8; Wrought Turnings, 1/2 ton, \$8; Cast Iron Boring, \$6; Old Plow Steel, \$9; Tool Steel, 1/2 ton, \$15; Locomotive Steel Tire, 1/2 net ton, \$13; Buggy Springs, 1/2 net ton, \$14.50; Malleable Scrap, \$5.

EVERETT & POST, 156 Lake street, Chicago, report to us as follows, under date of September 8, 1884: **Pig Lead.**—There has been no noticeable change in the market since our last circular, values being entirely nominal at 3 1/2¢ and 3.4¢. There has been some inquiry, but principally for future delivery, and few refiners are willing to sell ahead at present values; consequently, but little business has been done. There is but little Lead offering, but apparently enough to supply all present consumptive requirements. To-day's market shows more firmness, and may be quoted at 3.4¢.

Chattanooga.

Office of The Iron Age, Carter and Ninth Sts.,
CHATTANOOGA, September 8, 1884.

Business men generally report some improvement in commercial lines. Southern crops are better than expectations of them warranted two months ago, but low prices hold grain and other commodities out of market. Very little food for men or animals will have to be drawn from the North this year. The cotton crop will be about an average. The building season is now at its height, and more is being done in that line than early summer prospects seemed to warrant. The week has been hot and sultry, ending with timely rains.

Pig Iron.—In this district the movement of metal is large. More has been handled in 10 days past than in the previous 10 days. Buyers have ceased asking lower quotations, and strong holders show less disposition to sell. Some 10,000 tons were sold during the week by local furnaces, mostly No. 1 Foundry, at \$15 to \$16, cash, on cars at shipping point. The banking-in scheme is not mentioned any more. We doubt if the principal companies of the South would now seriously consider it. Managers generally believe

THE IRON AGE.

there will be a small advance before the new year opens, and they are not losing any money. We quote small lots, 60 days: No. 1 Foundry, \$17 @ \$18; No. 2 Foundry, \$16.50; Gray Forge, \$14 @ \$15; White and Mottled, \$13 @ \$14; Car-Wheel Metal, \$22 @ \$24.

Ores.—We quote Fossiliferous Ores, averaging about 50 % Metallic Iron, \$1.50 per ton, delivered at river landings; higher qualities, \$2. Brown Hematite, \$2 @ \$2.25 on cars at furnace.

Miscellaneous Articles.—Old Rails, \$16, nominal; Wrought Scrap, \$11 @ \$14; Old Wheels, \$16; Cotton Tie Clippings, \$10, with very little inquiry for any article in the list.

Merchant Iron.—Bar continues dull at \$1.70 for car lots; Spikes, \$2.25; Bolts, \$2.50 @ \$2.75; Splices, \$1.70.

Nails.—The demand is fair at \$2.15 for big bills.

Barb Wire.—Cambria Link and Four-Point, Galvanized, 6¢ per lb.

Coal.—We quote Fancy Lump at \$3; Common Lump, \$2; Egg, \$2.25, delivered. Run of mine to manufacturers, \$1.50 at mills.

Coke.—We quote at \$2 @ \$2.25 at furnace; Foundry Coke at 8¢ @ 10¢ per bushel.

Cincinnati.

SEPTEMBER 8, 1884.—**Pig Iron.**—Answers to inquiries show the situation of the market to be substantially as reported last week. It seems to be generally conceded that no lower prices will be found. The short supply of No. 1 Hanging Rock and strong Coke Iron is beginning to be felt, as substitutes for it are not easily found. Quotations:

CHARCOAL FOUNDRY.
Hanging Rock, No. 1, \$21.50; No. 2, \$20 @ \$20.50
Alabama and Tennessee, No. 1, 19.00; No. 2, 18 @ 18.50
Lake Superior No. 1, 18.50; No. 2, 18 @ 18.50
Cylinder, 18.50 @ 19.00

COKE FOUNDRY.
Hanging Rock, No. 1, \$18.50; No. 2, \$17.50 @ \$18.00
Alabama Tennessee and Virginia, \$15.50 @ \$16.00
Hanging Rock, No. 1, 17.50; No. 2, 16.50 @ 17.00
Pennsylvania and East, 16.00 @ 16.50
Ohio, No. 1, 15.50; No. 2, 15.00 @ 15.50

STONECOAL FOUNDRY.
Hanging Rock American Scotch, \$18.25; No. 2, \$17.25 @ \$17.50
Hanging Rock Silver-Gray, 18.25; No. 2, 17.25 @ 17.50
Softeners, No. 1, 18.25; No. 2, 17.25 @ 17.50
Others, 15.00 @ 17.00

C. & CAR WHEEL.
Hanging Rock, Cold Blast, \$27.00 @ \$29.00
Hanging Rock, Warm Blast, 22.00 @ 24.00
Alabama, Warm Blast, 22.00 @ 24.00
Lake Superior, 22.00 @ 24.00

FORGE.
Alabama, Tennessee and Virginia, \$15.50 @ \$16.00
Hanging Rock Coke, 16.00 @ 16.50
No sales of Scrap reported.

St. Louis.

HOFFER & Co. of St. Louis, report to us as follows, under date of September 8, 1884: We have no improvement to note in the condition of the iron market. Prices remain about as last reported.

HOT BLAST CHARCOAL IRONS.
Missouri, \$17.50 @ 18.00
Southern, 18.50 @ 19.00
Ohio, 19.50 @ 20.00

COAL AND COKE IRONS.
Missouri, 17.50 @ 18.00
Southern, 17.00 @ 18.00
Ohio, 20.00 @ 23.00

MILL IRONS.
Red-short, 17.00 @ 17.50
Neutral, 16.00 @ 17.00

FORGE.
Stonecoal, Coke and Charcoal, 15.00 @ 20.00

Louisville.

GEO. H. HULL & Co., Commission Merchants, report to us as follows, under date of September 8, 1884: The market is firm, and inquiries very much better. We make but slight change in quotations, but the furnaces are now holding their iron at our outside quotations, which are for cash in round lots:

PIG IRON.
Southern Coke, No. 1, Foundry, \$17.50 @ \$18.00
Hanging Rock, No. 1, Foundry, 16.00 @ 16.50
Hanging Rock Charcoal, No. 1, Foundry, 18.00 @ 18.50
Southern Coke, No. 1, Foundry, 22.00 @ 23.00
Silver Gray, different grades, 18.00 @ 19.00
Southern Coke, No. 1 Mill, Neutral, 15.00 @ 15.50
No. 2, 14.00 @ 14.50
Southern Coke, No. 1 Mill, Cold-sh't, 14.50 @ 15.00
White and Mottled, different grades, 15.00 @ 15.50
Southern Car-Wheel, standard, 13.00 @ 14.00

W. B. BELKNAP & Co., Iron and Steel Merchants, Nos. 115 to 121 West Main street, Louisville, under date of September 8, 1884, report as follows: We can report only the same uninteresting features of a dull market. The immense curtailment of production is necessarily forcing some movement in the still open channels, but even there it is so sluggish that no response whatever in way of prices can be detected. The mills which have kept running in hopes of improvement toward a fair remuneration for their labor seem losing heart and dolefully announce that they, too, will probably close down "as soon as present orders are disposed of." This threat, however, is something like the ecclesiastical "finally" and "lastly"—subject to indefinite extension—for the "present orders" are added to in a small way, but so constantly that work ahead may be unexpectedly provided. Bars.—Owing to very low river and very low figures this market is getting its full share of business. Prices range from \$1.80 to \$2. Sheet.—Heavy gauges are remarkably firm. Nos. 10 to 14 are not as low as \$6 a ton as they were in 1879—a time when Bar was not as low as at present. Of the lighter gauges there has been an overproduction, and many mills and jobbers continue to offer lots at prices that seemed abnormally low even last spring. Nails.—Are rather more interesting than the other items. There has been a large amount of building in all the cities despite a general business depression, but

owing to the establishment of new mills and the largely increased facilities of the older ones, there has been more put on the market than it could readily absorb and the price has sagged the season through. Steel nails have been vigorously pushed by the manufacturers. We doubt if any new staple has ever been more persistently and skillfully advertised. In consequence there is a growing demand for them. The circulars state that the difference in cost between the Steel and Iron Nails is only 5¢ or 10¢ per keg. This disturbs the jobber of both somewhat, for quotations for Iron. There is in reality no fluctuations. Steel may be quoted here \$2.45 @ \$2.50; Iron, \$2.35 @ \$2.40, with small concessions in large lots. Barb Wire.—The demand is much better, but transactions are limited and at low prices. General trade is picking up, collections are better, and, on the whole, the outlook is by no means dark.

Baltimore.

W. N. WYETH, Iron and Steel Merchant, 46 and 48 South Charles street, reports to us following, under date of September 8, 1884: There has been improvement both on inquiry and demand for the past week, and we have to report a much better feeling existing in all directions. Values remain about the same as last quoted, and will doubtless stiffen in the near future.

Ref. Bar Iron, 1 to 6 x 3/4 to 1 1/2 x 10-12 @ 2 1/2
1 to 4 1/2 x 1 1/2 to 1 1/2 x 10-12 @ 2 1/2
and Square, 1 1/2 x 10-12 @ 2 1/2
Hoop Iron, 1 1/2 wide and upward, 2 1/2 @ 3
Band Iron, from 1 1/2 to 6 in. wide, 2 1/2 @ 3
Horse-shoe Iron, 2 1/2 @ 3
Norway Nail Rods, 3 1/2 @ 3-10 @ 2-10 @ 2-10
Black Diamond Cast Steel, 10 @ 11
Machinery Steel, 10 @ 11
Spring Steel, 4 1/2 @ 5
Common Horse Nails, 10 @ 4 1/2
Railroad Spikes, 3 1/2 x 9-10 @ 2 1/2
Perkins Horse Shoes, 1/2 keg of 100 lbs. \$3.75 @ 4.50
Mule Shoes, 1/2 keg of 100 lbs. 4.50 @ 5.00

Imports and Exports.

The following were the Imports of Hardware, Iron, Steel and Metals into the Port of New York for the week ending September 9, 1884:

Hardware.
Baker Hermann & Co.,
Hdw., cutlery and guns, pkgs., 78
Bing, Ferd & Co.,
Iron ware, cs., 26
Drexel, Morgan & Co.,
Cases, 3
Field Alfred & Co.,
Mdse., cs., 20
Folsom H. & D.,
Mdse., cs., 9
Fuchs & Lang,
Wire rods, pkgs., 308
Mach'y, pkgs., 11
Gerard Otto,
Packages, 128
Godfrey C. F.,
Mdse., cs., 5
Hartley & Graham,
Mdse., cs., 10
Hecht Bros.,
Cases, 5
Knauth, Nachod & Kuhne,
Mach'y, cs., 8
McCarty & Hall Trading Company,
Cases, 21
Moore's Sons J. P.,
Mdse., cs., 14
Riethel & Co.,
Nails, cs., 39
Souriot Emile,
Mach'y, cs., 5
Ward Aseline,
Mdse., cs., 3
Wiesbush, Hilger & Co.,
Wire and cutlery, pkgs., 20
Cases, 12
Windmiller & Roelker,
Arms, cs., 4
Mdse., cs., 6
Witte John G. & Bro.,
Cutlery, cs., 4

Iron.
Baltzer & Lichtenstein,
Rods, coils, 1141
Baring Bros. & Co.,
Ore, tons, 282
Pig, tons, 270
Crocker Bros.,
Pig, tons, 455
Spiegel, tons, 158
Downing R. F. & Co.,
Pig, tons, 500
Drexel, Morgan & Co.,
Wire rods, coils, 2492
Zinc sheets, coils, 1504
Tin plates, bxs., 1502
Tin plates, bxs., 970
Fraser Jas.,
Type metal, ingots, 761
Hendricks Bros.,
Lead, pig, 60
Ketchem E. & Co.,
Tin plates, bxs., 95
Leavitt Geo. A. & Co.,
Stereos, plates, bxs., 11
Lough & Vonromondt,
Old metal, bds., 9
Mayer, Strouse & Co.,
Lead, pig, 20
McKesson & Robbins,
Antimony, cs., 50
Merrick C. S. & Co.,
Tin plates, bxs., 72
Mill H. E. & Co.,
Tin plates, bxs., 793
Naylor & Co.,
Tin plates, bxs., 4193
Pheips, Dodge & Co.,
Tin plates, bxs., 9246
Order,
Tin pl'ts, bxs., 81,728
Spefcer, plates, 5262
Pumbago, bds., 1101
Tin, slabs, 2404
Antimony, cs., 33
Zinc oxide, bds., 50
Spelter, ingots, 1202

Metals.
Baldwin Bros. & Co.,
Platina ware, box, 1
Bendit, Drey & Co.,
Metal ware, case, 1
Beck & Co.,
Tin, bds., 5
Bank of Montreal,
Tin plates, bxs., 4457
Bruce & Cook,
Tin plates, bxs., 1800
Blake Bros. & Co.,
Pumbago, bds., 435
Cort N. L. & Co.,
Tin plates, bxs., 830
Crocker Robert & Co.,
Tin plates, bxs., 1504
Zinc sheets, coils, 1504
Tin plates, bxs., 1502
Tin plates, bxs., 970
Fraser Jas.,
Type metal, ingots, 761
Hendricks Bros.,
Lead, pig, 60
Ketchem E. & Co.,
Tin plates, bxs., 95
Leavitt Geo. A. & Co.,
Stereos, plates, bxs., 11
Lough & Vonromondt,
Old metal, bds., 9
Mayer, Strouse & Co.,
Lead, pig, 20
McKesson & Robbins,
Antimony, cs., 50
Merrick C. S. & Co.,
Tin plates, bxs., 72
Mill H. E. & Co.,
Tin plates, bxs., 793
Naylor & Co.,
Tin plates, bxs., 4193
Pheips, Dodge & Co.,
Tin plates, bxs., 9246
Order,
Tin pl'ts, bxs., 81,728
Spefcer, plates, 5262
Pumbago, bds., 1101
Tin, slabs, 2404
Antimony, cs., 33
Zinc oxide, bds., 50
Spelter, ingots, 1202

PIG IRON.
Southern Coke, No. 1, Foundry, \$17.50 @ \$18.00
Hanging Rock, No. 1, Foundry, 16.00 @ 16.50
Hanging Rock Charcoal, No. 1, Foundry, 18.00 @ 18.50
Southern Coke, No. 1, Foundry, 22.00 @ 23.00
Silver Gray, different grades, 18.00 @ 19.00
Southern Coke, No. 1 Mill, Neutral, 15.00 @ 15.50
No. 2, 14.00 @ 14.50
Southern Coke, No. 1 Mill, Cold-sh't, 14.50 @ 15.00
White and Mottled, different grades, 15.00 @ 15.50
Southern Car-Wheel, standard, 13.00 @ 14.00

W. B. BELKNAP & Co., Iron and Steel Merchants, Nos. 115 to 121 West Main street, Louisville, under date of September 8, 1884, report as follows: We can report only the same uninteresting features of a dull market. The immense curtailment of production is necessarily forcing some movement in the still open channels, but even there it is so sluggish that no response whatever in way of prices can be detected. The mills which have kept running in hopes of improvement toward a fair remuneration for their labor seem losing heart and dolefully announce that they, too, will probably close down "as soon as present orders are disposed of." This threat, however, is something like the ecclesiastical "finally" and "lastly"—subject to indefinite extension—for the "present orders" are added to in a small way, but so constantly that work ahead may be unexpectedly provided. Bars.—Owing to very low river and very low figures this market is getting its full share of business. Prices range from \$1.80 to \$2. Sheet.—Heavy gauges are remarkably firm. Nos. 10 to 14 are not as low as \$6 a ton as they were in 1879—a time when Bar was not as low as at present. Of the lighter gauges there has been an overproduction, and many mills and jobbers continue to offer lots at prices that seemed abnormally low even last spring. Nails.—Are rather more interesting than the other items. There has been a large amount of building in all the cities despite a general business depression, but

The imports of Cutlery, Metals and Hardware for the week ending September 5 were as follows:

Quantity. Value.
Anvils, 99 565
Antimony, 2 915
Brass goods, 28 4,780
Bronzes, 28 4,780
Chains and anchors, 58 6,744
Clocks, 21 1,389
Cutlery, 208 12,374
Cutter, 1 1,153
Guns, 20 25,096
Hardware, 113 13,564
Iron, pig, tons, 5 263
Iron, sheet, tons, 1,610 24,584
Iron, other, tons, 28 137
Lead, pig, tons, 1,221 46,151
Machinery, 829 2,080
Metal goods, 118 9,311
Nails, 828 6,028
Needles, 27 5,411
Old metal, 6 4,187
Plateware, 9 3,978
Pumbago, 512 2,728
Percussion caps, 52 8,054

Exports.
The following were the Exports of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the week ending September 9, 1884:

Bremen.
Mf. iron, pkgs., 79 2,498
Hdw., case, 1 24
Dutch East India,
Ptm., gals., 64,000 64,000

Copenhagen.
Ag. imp., pkgs., 7 137
Mach'y, pkgs., 5 145
Clocks, cs., 14 54
Writers, cs., 13 53
Hdw., cs., 59 2,148
Scales, case, 1 15

Christiana.
Ptm., gals., 118,863 9,100
Sew. ma., cs., 52 1,160

Elseneur.
Ptm., gals., 339,107 26,780

Stettin.
Ptm., gals., 126,004 11,900

Hamburg.
Evaporators, 2 125
Hdw., pkgs., 239 4,170
Pig, presses, 4 500
Tacks, cs., 4 39
Knit, mach., 4 39
Mach'y, pkgs., 4 711
Ag. imp., pkgs., 7 368
Clocks, cs., 35 874
Sew. ma., cs., 4 134 35,620
Ptl., gals., 1,641 10,150
Iron pipe, pcs., 168 824
Arms, case, 1 265
Iron ore, cs., 2 190

Amsterdam.
Ptm., gals., 314,702 25,000
Pumps, pkgs., 2 133
Sew. ma., cs., 218 4,756
Ag. imp., pkgs., 1 30

Antwerp.
Ptm., gals., 818,567 69,638
Rifles, cs., 1 178
Sew. mach., cs., 74 1,474
Cutlery, case, 1 28
Copies, cs., 50 9,000
Mach'y, cs., 4 366
Pistols, case, 1 4,660
Hdw., cs., 1 82
Ptl., cs., 30 558

Rotterdam.
Clocks, pkgs., 4 48
Hdw., cs., 28 628
Saws, cs., 3 31
Copper, cases, 23 4,025

Bristol.
Ptl., gals., 39,373 8,049

Emmouth.
Ptm., gals., 137,172 12,336

Great Yarmouth.
Ptm., gals., 132,405 10,381

Liverpool.
Hdw., pkgs., 87 3,002
Ag. imp., pkgs., 8 311
Ptl., cs., pkgs., 148 545
Mach'y, pkgs., 7 1,307
ML iron, pkgs., 4 366
Ox. zinc, bds., 50 357
Cop. ore, bags, 2300 14,000
Ptm., gals., 459,000 40,500
Iron rods, cs., 30 1,300
Cop. mat., bgs., 6015 21,740
Sew. ma., cs., 14 893
Brass tube, 1 21
Pistols, case, 1 36
Saws, case, 1 36

London.
Ptl., gals., 1,090,088 82,029
Hdw., pkgs., 204 5,282
Pumps, pkgs., 2 125
Ptl., gals., 56 1,301
Pumps, pkgs., 11 1,187
Clocks, pkgs., 238 9,707
L. safes, pkgs., 2 640
Ag. imp., pkgs., 6 125
Mach'y, pkgs., 141 12,340
Sew. ma., cs., 42 1,500
Brass gds., cs., 8 304
Pistols, case, 1 30
Nails, case, 1 30

Belfast.
Ptm., gals., 203,006 16,748

Glasgow.
Ptl., gals., 111,410 9,749

Hull.
Pumps, pkgs., 2 75
Hdw., pkgs., 243 5,628
Clocks, pkgs., 211 3,128
Saws, cs., 1 21
Ag. imp., pkgs., 7 239
Mach'y, pkgs., 15 730

Oboltrair.
Ptm., gals., 111,410 9,749

Glascow.
Nails, bds., 210 600
Mach'y, pkgs., 2 300
Clocks, pkgs., 12 400
Ox. zinc, bds., 50 357
Pumps, pkgs., 15 1,033
Sew. mach., cs., 144 6,834
Guns, cs., 1 50
Windmills, cs., 3 108
Hdw., cs., 3 127
W. metal, cs., 5 120
Mf. iron, pkgs., 4 112

British West Indies.
Ag. imp., pkg., 1 16
Ptl., gals., 6384 612
Hdw., pkgs., 13 252
Nails, bds., 3 30
Mach'y, pkgs., 5 30
Tacks, case, 1 40
Iron safe, 1 50
Nails, cs., 1 232
Nails, cs., 10 30
Mf. iron, pkgs., 3 127
Sew. ma., cs., 13 295

British East Indies.
Ptm., gals., 275,000 26,125

New Zealand.
Hdw., cs., 1 50

New Brunswick.
Tin crystals, keg, 1 49
Ptm., gals., 567 6,114
Mf. iron, pkg., 1 5

Newfoundland.
Hdw., cs., 12 275
Mach'y, pkg., 1 128
Saws, case, 1 43
Nails, keg, 1 18
Sheathing, rolls, 10 17
Sew. ma., cs., 14 239
Ag. imp., pkgs., 6 41
Hdw., cs., 1 66
Cutlery, case, 1 28
Mf. iron, pkgs., 19 280

Novo Scotia.
Hdw., cs., 2 79
Ptm., gals., 40,850 4,180

British Australia.
Mf. iron, pkgs., 215 4,899
Hdw., cs., 112 19,699
Cartridges, cs., 1 15
Sew. ma., cs., 333 12,656
Nails, cs., 88 741

Quan. Val.
Iron, bds., 34 1,247
Wire gds., cs., 2 65
Ptm., gals., 650 97
Nails, cs., 87 155
Tacks, cs., 10 97
Nails, kegs, 34 114

INDUSTRIAL ITEMS.

MASSACHUSETTS.
Both the Mount Hope and the Old Colony Iron Works, at Somerset, which have been stopped for some little time, resumed operations last week. The stove foundry has commenced running five days per week, and it is probable it will now run right along.

The iron foundry to be established by Mr. Pratt, of Carver, will be located near the railroad track south of the depot at Campello. A spur track will be built to run alongside the foundry.

The Fitchburg Steam Engine Company, of Fitchburg, are running their entire works to their full capacity, and the following are a few of the parties whom they are building engines for at the present time: One 40-horse-power engine for Valentine Wilson's new mill at Lowell; one 50-horse-power engine for the Hollingsworth & Whitney Paper Company; one 30 and two 40-horse-power engines for the Van Nortick Paper Company, Batavia, Ill.; one 50-horse-power for a Worcester party; one 50-horse-power for the American Printing Company, Fall River, besides several other parties. Poole & Hunt, of Baltimore, Md., lately ordered six of this company's engines in one order. The company have at Fitchburg a large, fine shop fitted up with special tools for building engines, and do not carry on any other branch in connection with their engine business. For electric-lighting purposes this engine is said to be well fitted.

RHODE ISLAND.
The Herreshoffs' Works, of Bristol, which had been partially shut down for three weeks past, to give their employees the usual vacation, started up on Monday morning of last week in all the departments.

CONNECTICUT.
The Hopson & Chapin Manufacturing Company, of Wethersfield, announce their readiness to undertake the production of fine decorations in iron from original designs or reproductions of existing patterns, having recently made very successful experiments with the view of the satisfactory reproduction of fine armor, shields, swords, pikes, &c., and other decorative pieces of merit requiring a very high degree of art in iron founding. The plant of their works embraces complete equipment for casting iron and brass, bronzing, japanning, coppering, lacquering, polishing, brass electro-plating on iron, and pattern designing and building in wood, soft metal, brass and iron. They also have a machine shop. Their telegraphic address is Hartford.

George P. Clark, of Windsor Locks, has been running his rubber wheel and truck manufactory overtime for the past two months, to keep pace with orders. He has just filled several large contracts for heavy mill trucks and stock cars mounted on patent rubber wheels.

The Middletown Rubber Company, of Middletown, will remove to Bridgeport as soon as their new works, now building, are ready for use.

The Cowles Hardware Company are about to remove from Unionville to Bridgeport. Having suffered much inconvenience from a lack of room and shortage of power at the former place, they have purchased a site of P. T. Barnum near the latter city, and are putting up a new factory for the manufacture of hardware specialties, embracing screw-drivers, mincing knives, spring hinges, &c. Their building will be in the form of an L, and its total length will be 300 feet. The works are well under way and will be ordered early in October. Among the orders recently entered were 11 from London, England, which were received on the 1st inst.

The new foundry at Putnam has started up, beginning to mold castings.

The first watch made by the Seth Thomas Clock Company, of Thomaston, has been recently completed and put into running order. It is expected that the company will be able to put their watches in the market at an early day.

The Howe Sewing Machine Company are to give a bronze statue of the late Elias Howe, Jr., to the city of Bridgeport. It is now ready, and will be placed in Seaside Park. The statue is 8 feet high and valued at \$25,000.

NEW YORK.
The Bentley-Knight Electric Railway Company have applied for a charter in New York City. The company are to build, sell and let locomotives and other rolling stock for railways in the United States and Canada. The capital stock is \$1,000,000, divided into shares of \$100. Messrs. Bentley and Knight are two young men who gained their reputation in working out a system for underground wires. Lately they have been experimenting with electric railroads at Cleveland, Ohio, the result of which has been the forming of the new company.

Shipments of the Buffalo Forge Company for last week were: Eight hundred forges to a large Western jobber (unquestionably the largest single shipment of portable forges ever made); large double shavings-exhaust fan to Michigan Central Railroad shops; Michigan; larger blower and stationary blast forges to Smith shop equipments of forges to Canadian Pacific Railroad Company, Winnipeg, Manitoba; large cupola blower and counter-shaft to Enterprise Foundry Company, Rochester, N. Y.; lot of forges to Mexico and West Indies for plantation use, besides usual shipments for their regular trade. They are now completing an order for portable forges for direct shipment to Turin, Italy, and Odessa, Russia; also one large 10-foot blower for Reeves Iron Company, Canal Dover, Ohio, and several power punches and shears for Jas. Beggs & Co., New York City.

The employees of the Albany Iron Works, of Troy, have voluntarily agreed to accept a reduction of 10 per cent. in wages, and D.

H. Lentz, the superintendent, at once issued orders to light up the works. He says with the decrease in wages he thinks the works can be kept running on full time.

NEW JERSEY.
The employees of the Oxford Iron Company, at Oxford, Warren County, have been informed of a 10 per cent. reduction of their wages, to take effect on September 15.

PENNSYLVANIA.
The contract for supplying the new nail factory at Pottstown with machinery has been partly awarded to the Atlas Works, of Pittsburgh. The order includes an engine 23 x 48 for the nail-plate mill, an engine 22 x 24 for the nail mill, and also a nail-plate train.

The Cambria Iron Company are drilling for gas at Johnstown.

Stewart & Co.'s old rolling mill at South Easton is now being converted into a wire mill. The machinery, boilers, &c., recently purchased by the company at works in Brooklyn have been hauled to the mill and will soon be placed in position.

On the 30th ultimo the Scranton Steel Company, of Scranton, with two 4-ton converters, turned out 287 gross tons of Bessemer steel ingots, beating their previous best record and far surpassing any record made by similar plants. The works run single turn only. The week's work was 1502 tons of ingots, the rail mill rolling 1346 tons of rails. When it is considered that these works were designed to make only 1200 tons of rails weekly, double turn, and that they have exceeded this, running only single turn, it will be seen how far they have gone beyond the most sanguine expectations of their projectors.

According to the Steelton Reporter, the Pennsylvania Steel Company's merchant mill has enough orders booked to keep the mill in constant operation till the 1st of January next. An order has been booked from the Oliver & Roberts Wire Company, of Pittsburgh, for 50 tons per day for four months for billets for wire purposes. The blast furnaces are all in operation and producing largely.

PITTSBURGH AND VICINITY.
A. French & Co. and the French Spira Spring Company, of Pittsburgh, have been consolidated under the name of A. French Spring Company, Limited. Joseph M. Rogan retains the Western agency of the consolidated concerns.

Park, Bro. & Co., Limited, have just rolled the largest steel circle ever made in this country. It is 113 inches in diameter and 1 1/4 inch thick. They will send it to the St. Louis Exposition.

The Dunbar Coke Company, which were compelled to make an assignment recently, have been dissolved by a unanimous vote of the members.

Articles of association of the Morland Manufacturing Association, Limited, were filed on Monday. The capital stock is \$200,000, and the object of the company is to manufacture nuts, bolts, &c.

INDIANA.
Millen & Sons Stove and Pipe Manufacturing Company, of South Bend, intend laying out \$3000 in improving their buildings, besides putting in a new 50-horse-power engine, as their business is increasing so rapidly that they find it necessary to enlarge their facilities.

OHIO.
The well-known iron firm of Cleveland, Brown & Co. have purchased the Falcon Rolling Mill, at Niles, at sheriff's sale, for \$16,000.

The rolling mill at Massillon, which has been undergoing repair, lighted its fires again last week.

Work was resumed at the Akron Iron Company's rolling mill last week, after a brief shut-down for repairs.

The gas at the Jefferson Iron Works' well at Steubenville, which recently ceased, is now flowing as strong as ever.

The Acme Machinery Company, composed of F. W. Bruch, M. D. Luehrs and C. Greve, are building at Cleveland a two-story brick shop, 40 x 120, for the manufacture of the Acme bolt cutters and other bolt and nut machinery. The works are expected to be in operation about the 6th of October, and will start with about 20 machines, comprising lathes, planers,

Trade Report.

General Hardware.

Some manufacturers report large sales during the past month, but at close and often unremunerative prices. The general report on the street, however, is that business is dull, the large buyers especially ordering with extreme caution. Since the first of the month there is a perceptible improvement in the volume of business with the retail trade, which is being carefully cultivated by manufacturers and jobbers. Prices in several lines are decidedly weak, and careful buyers can get concessions on regular quotations. Collections are sluggish, and in some sections there is a disposition to ask for a longer time on purchases.

CUTTING PRICES STILL.

Most of the communications which we have received upon this subject have been from manufacturers, with a few from jobbers, who have not, however, been eager to discuss the subject. We are in receipt, also, of a number of letters from the retail trade, in which the matter is referred to from their standpoint and according to their experience. Without exception they refer to the existence of the practice in question. One house in Illinois writes us that they buy most of their shelf goods from jobbers in Philadelphia and Chicago, and add that they can invariably do better with jobbers than with manufacturers. They mention that on the day of their writing they received quotations from both jobbers and manufacturers on Tackle Blocks, Door Hangers and other goods, and that the jobbers' prices were 10 per cent. lower than the manufacturers'. Another merchant in Tennessee says that he purchases most of his light goods from Hardware commission merchants and manufacturers' agents, mentioning as his experience that when there is a cut in prices they will meet it quicker than the factories. He adds, also, that he frequently purchases of jobbers at cut prices which are lower than those given by the manufacturers. In illustration of this he mentions that the other day he bought a certain line of goods from a jobber at discount 50 and 10 per cent. when the best price he could obtain from the factory was discount 50 per cent. As a further illustration he advises us that he can buy another article from jobbers at \$6 per dozen when the factory price is \$7.

We have heard from some large jobbing houses that, in their judgment, the practice of cutting prices by the jobbers has been very much exaggerated in the communications which have appeared in these columns from the manufacturers. They acknowledge that occasionally in the present unsettled and weak condition of the market there is a tendency to sell certain staple lines as leaders, but express the opinion that, on the whole, jobbers sustain the prices as well as the manufacturers. They, indeed, are disposed to reply to the manufacturers' complaints by retorting that the manufacturers themselves are all too ready to sell goods to the jobbers' legitimate trade at prices that approximate those which they themselves receive. In this matter we desire only to give the real facts in the case, and have brought this usage, acknowledged and regretted by all, to the attention of our readers, in the hope that it will be for the benefit of the whole trade to let in light on the subject. We should be very glad to hear from the retail trade of the country as to their experience in the matter, advising us to what extent they find the custom of cutting prices prevailing in their sections. We should like to know to what extent goods are sold to the good retail trade at better figures than those given in the Hardware quotations of this paper. These quotations represent, it is conceded, with very general accuracy the regular prices to such trade. If retailers can purchase at lower figures than our quotations, it would be an indication of the prevalence of this custom of cutting prices.

But, while we should be glad to hear from the retailers upon this question, we desire to add that in justice to the jobbers, whose permanent interests we believe we are advancing by calling attention to the existing irregularities, we shall be glad to hear from them also. If any erroneous impressions have been given in any of the communications we have published, they may be able to correct them. It may be that they also can suggest some method by which this existing evil may be remedied. As we have said before, we believe in fair play, want all the facts, and shall be glad to hear from any who are interested in the matter.

A house in Michigan writes to this effect: We notice that manufacturers are inclined to find fault with jobbers for cutting prices. We think this hardly fair, for, being in a position to know where the cutting comes from, we notice as much of that work from manufacturers as from jobbers. Manufacturers send their travelers to a Western city, and on his arrival he finds the jobbers well stocked with his goods, and in order to sell he visits the best trade that naturally belongs to that city. Then, as he has no one to protect, he makes any price he can get between the manufacturers' and jobbers' prices. Whatever price this may be, the manufacturers have to meet it, or not hold their trade. The jobber cannot buy of every one to keep them off the road. We know how it is ourselves, for the jobbers come the same trick over us. If we do not buy of them all, they sell to our best cus-

tomers. We can see no remedy as long as there are more goods than business.

But, turning now to the pile of letters we have received on this subject from manufacturers, we wish we had space to lay them in full before our readers, and that our judgment of expediency or the confidential nature of the communications left us at liberty to give the names of the writers. We may say, however, that many of the letters which we have already published, with those that we refer to in this issue, are from the largest and best houses, the writers being persons who are known through the whole trade. We have received a few letters in which our correspondents advise us that they have not been troubled by this cutting of prices; but in nearly all cases these are from houses the nature of whose business is such as to exempt them, to a large degree, from the practice. We have been surprised, however, at the unanimity with which the manufacturers, large and small, acknowledge the evil, and the earnestness with which they deprecate it.

From manufacturers of a leading line of goods we learn that for several years past they could not compete with jobbers in selling this class of goods to the trade. Jobbers, they say, send out their traveling men and make this line a leader, and, if they can obtain a good order for a general assortment of Hardware, will put in some of the goods in question at cost or the next thing to it. An instance is mentioned by the writer of one of these letters who had just learned from another manufacturer who endeavors to sell his production to the trade at large that he was compelled to accept of as low prices from them as those manufacturers of the same line received from the jobbers. He intimates that jobbers are, of course, dissatisfied with their profits on these goods, but adds that they are themselves to blame for the situation.

From the following letter, received from a large house of the highest standing in this city, it will be perceived that, in the judgment of the writer, manufacturers and merchants deplore this state of things, but have been led into it by existing competition. The suggestion that this condition of things is leading to a discontinuance of the practice of giving special quantity discounts to large buyers is of special importance in this connection. It is evident that if the cutting of prices continues this will be the inevitable result. The letter is as follows:

To the Editor of the Iron Age: Our attention has been directed to the remarks in the Trade Report of the 14th ult. on the cutting of prices, and you have probed a state of facts which certainly are very demoralizing. Manufacturers in general have considerable cause for complaint that jobbers undersell prices established by them on staple goods, and it is a constant source of disturbance. So far as our observation extends, however, the wholesale houses in this city, and a majority of them throughout the country, deplore this state of things; but when a few conspicuous houses offer certain staple goods at cut prices, the choice is presented to the others to either follow their example or sacrifice valuable trade. This has given the manufacturers so much annoyance that it prevents them in many instances, when associations are formed, from securing a majority vote to give a special quantity discount to jobbers who are worthy of it by virtue of their large purchases and a desire to maintain prices. The effect in some instances has already been to confine and reduce the amount of special discounts, and if a remedy to prevent these disturbances is not found they will have the tendency to abolish altogether these special favors which manufacturers under other circumstances would be willing to give the large jobbers.

Another manufacturer of this city intimates that it would be well if we would call the attention of the trade to the practice of some manufacturers who place the jobber in a position to do harm by cutting prices by giving him too broad a margin on his goods.

From another large manufacturing concern we learn that they do not allow their trade to undersell them, and, should they hear of such an instance, would withdraw quotations from such parties, which would remedy the difficulty immediately.

A suggestion to the same effect is made in the following letter from a manufacturer of Agricultural Implements, who, however, recognizes, as has already occurred to our readers, that this is a practicable remedy only in certain special lines where the manufacturers' goods must be had by the trade:

I see no way of stopping the pernicious custom on the part of most jobbers of giving away their special discounts obtained from the manufacturers, unless the manufacturer sells to them the goods upon condition that they abide by and adhere to such discounts as may be adopted by the manufacturer for his sales to the smaller dealers. Should a jobber fail to thus adhere to the prices, the manufacturer should refuse such jobber the sale of his goods. Such a procedure might work in the case of goods on which the manufacturer had a monopoly, and at times of great scarcity and of advancing markets; but, unhappily, neither of such conditions exists at the present time, when, as a rule, markets are glutted, no one has a monopoly, and prices are constantly declining. I very much fear that, as long as jobbers exist and manufacturers sell to them, the evil spoken of will never be prevented.

The following communication is from a Southern manufacturer. It will be perceived that the writer ascribes a large portion of the existing trouble to the custom of disposing of goods by traveling salesmen. He also touches upon other points:

We have just read the article in regard to the cutting of prices by the jobbers. We

consider the root of the whole evil to be in the fact that the trade is so largely in the hands of traveling men. While most of the responsible firms are not controlled by traveling men, many others are. The country merchants have recently got to be very shrewd buyers, and in a majority of instances do not tell the truth in order to get better prices than those offered. The inexperienced traveler, and sometimes those of more experience, in order to make a good showing will urge the jobber to meet those prices, which were never given by anybody, or they will lose the trade of certain good customers. When money is tight, as it has been recently, the manufacturers are not inclined to hold the jobbers up, as should be done, to strictly the same prices. If the jobbers have their own way they will always cut any way. In our line of business there is no cutting, as the jobbers know full well that in case the prices were cut we would take our goods from the hands of the traveler in the territory in which they were located, and sell directly from the factory. This has been done on two or three occasions several years past, and our jobbing trade understand that they cannot cut our regular merchants' prices. If other manufacturers held the jobbers up stiffly to the mark, and took prompt action when the prices were cut, there would be no trouble. The traveling man, though, is the foundation of very much evil, and has been the result of breaking up more than one concern that would have lived if sending out traveling men had not been the order of the day. It is an evil, though, that there seems to be no remedy for.

From another manufacturer we have this letter, in which the chronic failers are made to bear the blame of this demoralization in prices. It is a question, however, whether our correspondent does not ascribe too much influence to this troublesome cause:

I have for a long time experienced that a bull was in the china shop, with the evident intention of getting the best of the manufacturer and the honest trade, and this bull only thrives on the misfortunes and demoralization of others. I have satisfied myself as to what kind of a chap he is, and how he thrives. You are undoubtedly aware of a class of chronic failers, whose cash capital consists in what they owe, and check. They get in debt when they can, and as much as they can, with the studied purpose of failing when a reasonable excuse offers, which they avail themselves of to obtain the necessary sympathy to go on again on the payment of a fraction of a dollar of their indebtedness. This class has everything to do with the present situation and are responsible for it. They get credit by their reputation for smartness; they by misrepresentation, or worse, if it serves them better, get bottom figures on large quantities, from unsuspecting parties, and sell the same goods under the price they agree to pay, as a matter of business, to get the wherewith to meet pressing obligations, playing this game as long as credit lasts, to the demoralization of prices and loss of last men to be paid from receipts of others' property. It is self-evident that one such concern will demoralize the New York market prices, without one dollar bona fide cash capital, on the credit furnished by the manufacturers on the smart reputation. These parties, expecting to pay nothing from their own pockets, care nothing for their creditors or the welfare of the trade. The remedy is to stamp the bull out and let the old stock go under the hammer rather than encourage these smart chaps who claim ability to sell anything, relying on their check and misrepresentation ability to beat both the customer and creditor.

But other manufacturers have escaped the trouble caused by cutting prices by going to the small trade and even to the consumers. A house making a leading line of goods write that they have had very little experience with jobbers in their business. Their sales are largely to the consumers, as they have found it better to deal directly with them than through the jobbers. They express the opinion that there is a tendency with many of the Eastern manufacturers to bring themselves in direct communication with the consumers of their goods, and avoid passing their goods through the hands of jobbers as much as possible. As looking in the same direction we have the following letter from an Eastern manufacturer:

I have read with great interest your article on cutting prices in your issue of August 14, and also the comments on the subject in your issues of August 21 and 28. It has annoyed us very much, this cutting of prices by the jobbers, and we have been compelled to deal almost entirely with the retail trade and consumers. As a whole, we have found the jobbers very unscrupulous in adhering to prices, and I see no remedy except that the manufacturers sell their own goods to the retailer and even the consumer, and absolutely refuse to deal with the jobbers until they decide that the manufacturers have rights that they must respect.

From another house we have this letter, in which the suggestion is made that The Iron Age publish the manufacturers' printed prices, not attempting to give the figures at which the goods are sold by the trade generally:

We think that the growing evil of "cutting prices," as pursued by jobbers, is very liable to react upon the jobbers themselves unless they take some measures to put a stop to it. We do not believe that any jobber derives any lasting benefit from pursuing such a course, while it surely does much harm among jobbers and manufacturers by demoralizing trade and keeping prices unsettled. It does not affect us much, as our goods are specialties, having no competition, but we are aware that the practice causes much trouble, particularly on lines of goods where competition is very strong. We think that you would give better satisfaction by quoting the discounts as printed by the manufacturers themselves for best retail trade, as we believe that publishing "cut prices" only adds fuel to the fire and makes a bad matter very much worse. You would

then have a fixed basis for your quotations, which you could not have if you undertook to follow up and publish all of the cut prices that are made all over the country. We believe that manufacturers will gladly aid you by keeping you posted in regard to their changes in price, and you can surely help them greatly by exerting your influence strongly against this practice, which is doing great harm to many and good to none.

With all respect for our correspondent's opinion in this matter, the course of this discussion has been to show that the manufacturers' printed quotations would be but a poor guide to the prices at which the goods are actually sold. The price of Hardware is what it can be bought for, whether from manufacturer or jobber. If the jobbers make for the good retail trade lower prices than the manufacturers quote, they simply reduce the price of the goods and make it our duty to lower our quotations accordingly.

GUARANTEED TIN PLATES.

The evils attending the absence of specific quality standards for Tin Plates, and the injustice which consumers have suffered under a system which assumes that all Plates can be honestly graded to the standards of certain well-known brands, have been the subject of much complaint in the trade and of more or less editorial comment in The Iron Age. The demand for specific quality guarantees has at last been met by Messrs. Merchant & Co., of Philadelphia, who have placed on the market two brands of Roofing Plates, "Camaret" and "Gilbertson's Old Method," with quality guarantees which are perfectly satisfactory. "Camaret" Plates are guaranteed as follows: To double-seam under all conditions; to stand any test of working or bending which arises in roofing; to be of uniform gauge as branded; to be of full dimensions, with square corners; to be evenly coated and free from wire edges. "Gilbertson's Old Method" Plates are guaranteed as above; also that they carry 18 pounds of coating to the box of I. C. 14 x 20 and 36 pounds to the box of I. C. 20 x 28. In the case of these Plates the guarantee means that if they do not conform in every respect to the specifications they may be held subject to Merchant & Co.'s order. We regard this as a long step in the direction of reform in the methods of the Tin Plate trade. Whether Plates are of first, second or third quality, the consumer is entitled to know just what he is buying, and this he can never know under the system of grades under which most transactions in Tin Plates are effected.

ARRANGEMENT OF HARDWARE STORES.

From a retail Hardware merchant in Indiana we are in receipt of the following communication, which we take pleasure in laying before our readers as bringing up a matter of general trade interest. As intimated by our correspondent, many Hardware stores handling good goods and doing a fine business have an unattractive and disorderly appearance. The inquiry, which in this letter is addressed to the trade, is worthy of their consideration and reply, and we shall be very glad to have from our readers suggestions with reference to the matter.

To the Editor of The Iron Age: I am a retailer and take pride in having my store arranged tastefully. There are many articles, however, that I can find no way of keeping before my customers and yet making the display look neat. I should judge there are many others who have the same difficulty, from the disorderly appearance of many Hardware stores. My room is limited, and my trouble is with Hatchets, Hammers, Handled Axes, Steel Traps, Pruning Shears, Buck-Saws, Basting Spoons, Egg Beaters, Rat Traps, &c. My shelving is but 1 foot deep. There may be many who have overcome what seem unsurmountable difficulties to me, and I may know of a desirable plan of arranging some goods that are always in their way. If the subject is worthy of discussion through your columns, I am sure it would be of interest and benefit to your retail readers.

PACKING GOODS.

A house of standing, whose suggestions are of value, writes us intimating that it would be well to call the attention of manufacturers to some simple improvements that might easily be made in packing goods. Mortise Locks, it is suggested, should be furnished with screws, the same as Rim Locks—a point to which the attention of the trade was called in these columns some time ago. Axle Clips, our correspondent advises us, are received with the nuts loose in box, and it is added that a 12-inch wrench is usually required to screw them on. Greater care, they also suggest, should be used in the shipping of Tea Scales, so as to make them more secure, attention being also given to the weights, as 9 out of 10 boxes received by our correspondents are reported to have weights all over the box, while from one to two Scales are usually broken. Manufacturers will appreciate the importance of attending to details like these, the manner in which goods are packed and received having very much to do with the favor with which they are regarded by the trade.

RETAIL SYNDICATES.

The subject of syndicate buying has been already discussed with some fullness in these columns, but the question at that time related mainly to the large houses represented in important cities by so-called syndicate buyers. It is known to many in the trade that the same thing has been done on a smaller scale by merchants throughout the country, who have consolidated their orders on given lines in order to secure quantity discounts. This movement has already been carried to a considerable extent, and it

is for the interest of all concerned to be advised as to what is going on in this line. As illustrating how the thing is done in one case at least, we place before our readers the following communication from one Hardware house to another, omitting, however, names and date:

GENTLEMEN: With a view to our mutual benefit in the matter of Hardware purchases we address you.

During the past year, through the kindness of a personal friend (who is a commercial traveler) we have combined our orders for certain goods which have a quantity discount with four or five parties about the State whose trade does not interfere with ours, and thus secured that discount. It has worked so smoothly and to our entire satisfaction that it occurred to us this plan can be applied with advantage to a large share of our purchases. If, say, eight or ten concerns of accepted ability can agree as to whom they shall admit, and pool their interest, making common stock of any points they may have on goods wanted, then by combining orders make a quantity to go to manufacturers with, we can strengthen our respective positions on purchases.

Please advise us by return mail how you are impressed with the plan, if favorable or otherwise, and add any suggestion that may occur to you. Yours respectfully,

Appended to this is a list of Hardware men conveniently situated geographically for the carrying out of the project, and yet extending over a considerable section of country. We are not advised as to the success of this special movement, but the fact that it was undertaken and probably successfully consummated will be suggestive to both manufacturers and merchants.

NAILS.

The demand has been much more active for the past few days than it was during the preceding week. Prices, however, have given way under the pressure from parties anxious to realize, and the increasing sales are not imparting that strength to the market which might be expected under ordinary circumstances. Some of the most persistent sellers at low prices are now conscious of the critical condition of the Nail trade, and there are indications of a cessation of further attempts to force their goods on the market. The prospect for better prices is so discouraging, however, that the closing of a number of Eastern factories is imminent, one large establishment having already done so. Store prices in New York have ranged from \$2.15 to \$2.25 during the week, with the market in buyers' favor. Inquiries are coming from Southern points, but, even at the low prices now prevailing here, competition with the West is impossible in that direction.

The Jefferson Iron Works, of Steubenville, Ohio, have issued a circular dated September 1, in which they say: "Beginning with September, 1884, we propose to make a portion of our product of Steel. Our Clinch, Clout and 8d. Common Nails will be of Steel exclusively, and from time to time other sizes will be added. We shall not, for the present, make any distinction in price between Iron and Steel Nails, which is strictly as shown on another page of this circular, and shall fill orders in turn as received." They quote on a basis of \$2.25 for 10d. to 60d. or 60 days' time, or 2 per cent. off for cash, with an abatement of 10 cents per keg on orders of 200 kegs or over.

The Bellefonte Iron and Nail Company, Limited, of Bellefonte, Pa., manufacturers of Nails and Bar Iron, have employed Samuel A. Haines, 85 Chambers street, New York, to represent them and act as their agent for the sale of their Nails. Samples can be seen at his office, and he will always be prepared to quote the company's best prices.

CAST BUTTS.

We desire to correct the statement which was made in our last issue to the effect that the Reading Hardware Company had withdrawn from the Butt Association. This is not the case, as they are still members of it, although there has been a break in the combination on prices. The figures given in our last issue are, however, it should be borne in mind, the company's low figures, and not subject to the usual extra discounts. These figures are, we may add, met by other manufacturers, the market prices of Cast Butts being in a demoralized condition.

BARB WIRE.

Local establishments report a fair amount of orders coming in, but in this respect they seem to be exceptionally well situated, as reports from other works indicate a continuance of the previously reported unsatisfactory condition of affairs. The expected fall trade is delaying its appearance, but well-informed parties believe that it will come inside of two or three weeks at furthest. Prices under the circumstances are irregular. Some companies continue to quote Galvanized Four-Point at 5½ to 6 cents per pound, according to quantity, with Painted at 4½ to 5 cents, but others are willing to take orders at 5½ cents for Galvanized, without limit as to quantity, while rumors are current of even lower figures having been accepted.

STEEL GOODS.

The following changes in the standard list of Steel Farming Tools were made at the recent meeting of the Hoe and Fork Union: 8¼ and 9 inch Solid Shank Cotton Hoes, of Northern Field Hoe pattern and weight, were each advanced 20 cents per dozen. Long Handles on Five and Six Tine Manure Forks made \$1 per dozen less than D Handles, instead of 30 cents, as formerly.

The following additions were made to the list: Two-Prong Solid Shank Onion or Nursery Hoes..... \$9.00

L. COES' Genuine and Mechanics, PATENT Screw Wrenches
 MANUFACTURED BY
L. COES & CO.,
 Worcester, Mass.
 ESTABLISHED IN 1839.




Our Genuine Wrenches are made with straight bars, full width and enlarged jaw, having ribs cast inside, which strengthen the jaw and give a full bearing on front of bar. These improvements, in combination with our new ferrule, made with double bearings, an iron tube, fitted to the shank and resting against the lower bearings, rigidly held in position by the handle and nut, effectually preventing back thrust of ferrule (see sectional view), verify our claim that we manufacture the heaviest and strongest wrench in the market. None genuine unless stamped.

L. COES & CO.,
 Worcester, Mass.
 Warehouse,
 97 Chambers and 81 Reade Sts.
 NEW YORK.
DURRIE & McCARTY,
 Sole Agents.

1884. PENNSYLVANIA LAWN MOWER.



Has no Equal Surpassing all others, and pronounced "THE BEST."

For descriptive catalogue and prices write to

LLOYD & SUPPLEE HARDWARE CO., Philadelphia.
 DURRIE & McCARTY, New York.
 AMES PLOW CO., Boston, Mass.
 PRATT & CO., Buffalo, N. Y.
 SIMMONS HARDWARE CO., St. Louis, Mo.
 HAMILTON & MATTHEWS, Rochester, N. Y.
 MARKLEY, ALLING & CO., Chicago, Ill.
 HUNTINGTON, HOPKINS & CO., Sacramento and San Francisco, Cal.
 R. A. CULTER & CO., Peoria, Ill.
 DUCHARME, FLETCHER & CO., Detroit, Mich.
 LOCKWOOD, TAYLOR & CO., Cleveland, Ohio.
 WM. FRANKFURTH & CO., Milwaukee, Wis.

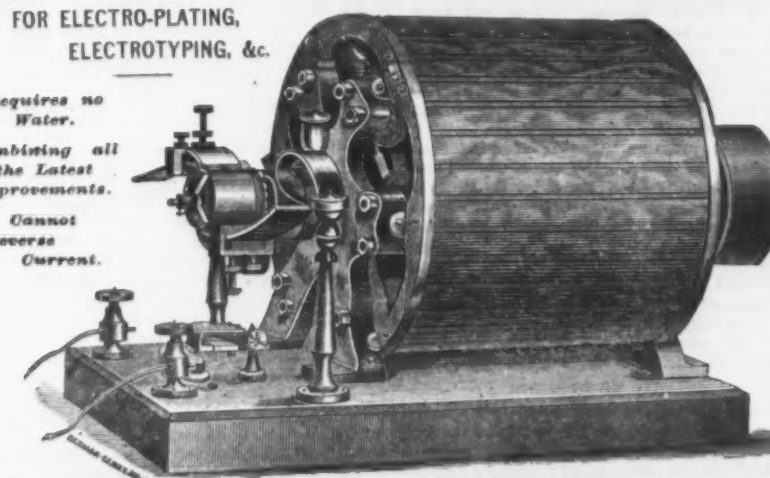
WALTER S. LUDLOW, Cincinnati, Ohio.
 LLOYD & CLARKE, La Crosse, Wis.
 H. MITHOFF & CO., Columbus, Ohio.
 BURROUGH BROS., Kansas City, Mo.
 THE TODD-DONIGAN IRON CO., Louisville, Ky.
 LAYMAN, CAREY & CO., Indianapolis, Ind.
 A. E. BONESTEEL, Troy, N. Y.
 FERRIN BROS., Lafayette, Ind.
 KRUSE & BAHLMANN, Cincinnati, Ohio.
 JANNEY, BROOKS & CO., Minneapolis, Minn.
 LOGAN, GREGG & CO., Pittsburgh, Pa.
 E. WHITMAN, SONS & CO., Baltimore, Md.
 SHULTZ & HOSKA, St. Joseph, Mo.
 OTT BROS. & CO., Wheeling, W. Va.

GEO. M. SCOTT,
 Bellows Manufacturer,
 Johnson Street,
 Cor. 29d St.,
 CHICAGO, ILL.



NIMICK & BRITTAN MFG. CO.,
 PITTSBURGH, PA.,
BUILDERS' FINE HARDWARE,
 Embracing Door Locks, Latches, Knobs, Butts, Sash Locks, &c.
IMPROVED ROSE ESCUTCHEON KNOBS,
 In GENUINE BRONZE & IMITATION BRONZE.
PADLOCKS.
 TEA, COUNTER, UNION AND PLATFORM SCALES.
 Catalogues and Lists furnished on application.
JOHN H. GRAHAM & CO., Agents, 113 Chambers St., New York.

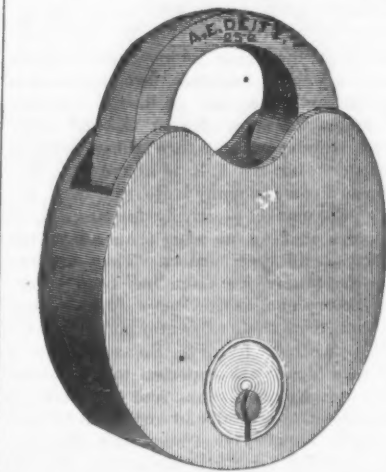
THE AMERICAN DYNAMO-ELECTRIC MACHINE.
 FOR ELECTRO-PLATING,
 ELECTROTYPING, &c.



Requires no Water.
 Combining all the Latest Improvements.
 Cannot Reverse Current.

THE ZUCKER & LEVETT CHEMICAL CO., Sole M't'rs,
 Manufacturers and Importers of NICKEL PLATING SUPPLIES,
 538 to 564 West 16th Street, NEW YORK.

A. E. DEITZ. "Greenfield" Forged Ox Shoe.



DURRIE & McCARTY, Agents,
 97 Chambers & 81 Reade Sts., New York.



CAST BRASS HARDWARE
 FOR
ICE HOUSES AND REFRIGERATORS.
 Manufactured and kept in stock by
W. & J. TIEBOUT,
 Manufacturers of
BRASS, GALVANIZED & SHIP CHANDLERY HARDWARE,
 Nos. 16 & 18 Chambers St.,
 NEW YORK.



ALWAYS GIVES THE
 UTMOST SATISFACTION

Main Belting Co.,
 Manufacturers of
THE LEVIATHAN COTTON BELTING.

Unsurpassed for Strength, Durability and Cheapness.
 Made to any Length, Width and Strength.
 Main Driving Belts.
 Guaranteed to Run Straight, Even Through-out.
 No Cross Joints, Unaffected by Damp. Clings well to the Pulley, Has no equal. In fact, is THE BELT.

MAIN BELTING COMPANY,
 S. W. cor. Ninth and Reed Sts., Philadelphia.
 Also
 248 East Randolph St., CHICAGO.

N. Y. STANDARD SCALE CO.,

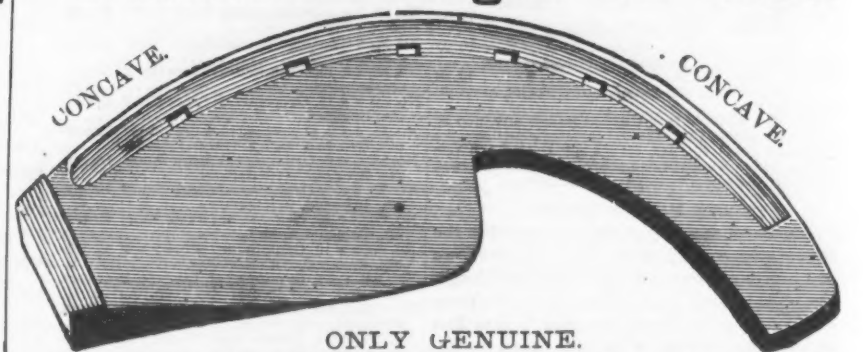


MANUFACTURERS OF
SCALES
 OF EVERY GRADE AND DESCRIPTION.
 COUNTER AND PLATFORM SCALES A SPECIALTY.
 FACTORY, KINGSTON, N. Y.
 OFFICE AND SALESROOM, 46 MURRAY STREET,
 T. W. WILLIAMS, Agent.
 Send for Price List.

GRANITE ROOFING
 (PATENTED).

For Steep or Flat Roofs. Felt and Burlap combined. A finished roofing; easy to lay, strong, elastic, durable and cheap. Best Roof for Furnaces. Acids and sulphur have no effect on it. Send for circular and sample.

THE GRANITE ROOFING COMPANY,
 15th and Washington ave., Philadelphia.



ONLY GENUINE.

Made under the Parker and Colburn Patents, from Burden's H. B. and S. Iron. Nail holes punched, and every shoe perfect.

The Parker and Colburn Patents cover broadly the dies by which the Shoes are forged. We are the only licensees, and all parties are cautioned against using either of the dies or the forging mechanism or processes so protected, as our rights under said patents will be fully maintained.

While we can furnish either the Concave Shoe with One Calk, or the Flat Shoe with Two Calks, we emphatically recommend the Concave, with one Calk, for the following reasons, viz.:

First.—Because the entire bearing of the shoe should come upon the shell of the hoof, and not upon the ball or tender part of the foot, as is necessarily the case with the flat shoe. This principle is recognized by all experts in the shoeing both of oxen and horses, and will prevent a tendency to sore-footedness.

Second.—Because by having one calk only, the shoe can be cut off or lengthened and fitted more perfectly to the foot.

Third.—Because by having one calk only, the shoer can make the other calk at any angle he desires.

No. 1, Full Length, Concave, 5 inches. Weight, per Set of Eight Shoes, 3 pounds.
 " 2, " " " 6 " " " " 3 1/2 " "
 " 3, " " " 6 1/2 " " " " 4 " "
 " 4, " " " 6 3/4 " " " " 4 1/2 " "

Packed in boxes or kegs of 100 pounds, half each rights and lefts. Full weight, and no charge for packages.

PRICES.

For orders of One Ton, or more, 9 cts. per pound.

1000 lbs., 9 1/2 " "

500 " 10 " "

less than 500 lbs., 10 1/2 " "

Terms, Net Cash, 30 days. Made only by

MILLERS FALLS CO.,
 74 CHAMBERS ST., NEW YORK.

COPYING PRESSES,



Patented Iron Planes, Cabinet Scrapers,
 Saw-Sets, Sewing Machine Stands,
HARDWARE SPECIALTIES.

We also Make a Superior Quality of
PULLEY CASTINGS,

AT SPECIAL PRICES.

SAMUEL C. TATUM & CO., Cincinnati, Ohio.

H. B. SEIDEL,
 President.

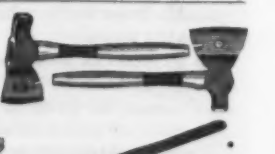
W. HASTINGS,
 Vice-Pres. and Gen'l Mgr.

E. T. CANBY,
 Sec. and Treas.

THE SEIDEL & HASTINGS CO.,
 WILMINGTON, DELAWARE,
 New York Office, No. 90 John St.; Entrance on Gold St.,
 MANUFACTURERS OF

BEST CHARCOAL BOILER PLATES,
 AND PLATE IRON GENERALLY.
 ALSO BEST QUALITY HOMOGENEOUS STEEL PLATES.

We ask the special attention of the trade to our C. H. No. 1 Boiler Plates, which we manufacture expressly for the Shells of Steam Boilers and stamp 50,000 pounds T. S. when desired. One hundred and sixteen tests of this iron, made during the last three years by the U. S. Inspectors of Steam Vessels, show an average tensile strength of 58,508 pounds to the sectional square inch, and an average reduction of area of the fractured section of 30% per centum. Our prices are as low as the production of a good article will admit of.



VARIETY IRON WORKS.

ALFRED C. REX & CO.,

MANUFACTURERS OF

HARDWARE SPECIALTIES, IRON TOYS & NOVELTIES.

Main Office and Factory: FRANKFORD, PHILA.

Phila. Sample Office, 415 Commerce St. New York Branch Office: 128 Chambers St.

SEND FOR CATALOGUE.

Bromhall & Spier, Manufacturers.

PURE TURKISH EMERY.
WALPOLE EMERY MILLS,
 South Walpole, Mass.

THE WEEK

In hematite pig iron there has been no movement whatever, mized lots of Nos. 1, 2 and 3 in usual proportions being nominal at 44/ @ 45/¢ ton. Stocks on the West Coast are still increasing, the foreign demand being extremely light and the home deliveries below a fair average. Elsewhere all grades of crude iron are quiet, with growing reserve stocks and prices in favor of buyers. Heavy manufactured iron is of late—that is to say, in poor request and quite nominal in values. Ordinary finished iron is also unchanged and nominal, with keen competition for the few orders about, and insufficient work to keep the mills more than about half employed. Prices remain much the same as they have been these two or three months past, published rates being no reliable guides to the figures actually accepted. Fencing wire and galvanized iron are easy and not in strong request. Old materials are neglected, especially on American account. Freighters are unchanged at my last week's figures. Steel is still in moderate demand only; indeed, many of the Sheffield houses have some difficulty in fluting their men work. A few concerns only are actively engaged on special forgings, castings, &c. The Bessemer houses are doing a tolerable turnover in rolled sorts, and the Siemens concerns are comfortably employed. Steel rails are without feature

	# box, I.C.
Crown extra best charcoal.....	19/ @ 19/6
Best charcoal (best soft steel, good charcoal coating).....	18/ @ 18/6
Best steel, good coke finish.....	16/6 @ 17/
2d ⁶⁵ common ⁶⁵	15/6 @ 16/
Derwent grade coke.....	15/9 @ 16/

PENANG, July 26, 1884.—*Tin*.—The market opened a fortnight since at \$25.15 per picul, and closed with great firmness at \$27.10. There has been a good European demand, 5000 piculs being taken, while for China only 1700 piculs were bought; receipts have been 8500 piculs, and the stock in bazar is 1900. Total export since January 1 to England, 62,860; to the Continent, 21, and 13, 871 to the United States. *Exchange*, four months bank, 3/8%.—*Schmidt, Kustermann & Co.*



Solid, Wilkinson's.....
Parallel, Fisher & Men...

Nails, Brads, &c.
New List, Sept. 1, 1882.

Tinned Swedes Tacks.....	dis 30 ½	
Tinned American Tacks.....	dis 30 ½	
Swedes Tacks, all kinds.....	dis 30 ½	
American Cut Tacks.....	dis 30 ½	
Copper Tacks and Nails.....	dis 30 ½	
Swedes Hungarian Nails.....	dis 35 ½	
Gimp and Lace Tacks.....	dis 30 ½	
Gimp and Lace Tacks, Tinned.....	dis 30 ½	
Finishing Nails.....	dis 25 ½	
Trunk and Clout Nails.....	dis 25 ½	
Common and Patent Brads.....	dis 20 ½	
Basket Nails.....	dis 20 ½	
Brush Tacks.....	dis 20 ½	
Leathered Carpet Tacks.....	dis 20 ½	
Chair Nails.....	dis 20 ½	
Double-pointed Tacks.....	dis 70 1/10 ½	

Tap Borers.
Common and Ring.....dis 20 ½
Ives' Tap Borers.....Nos. 1, 2, 3.....dis 15 1/10 ½
Ives' Tap Borers.....Nos. 13, 14.....dis 25 1/10 ½
Enterprise Mfg. Co.....dis 30 1/10 ½
Clark's.....dis 30 1/10 ½

Tapes, Measuring.
American.....dis 25 1/10 ½
Spring.....dis 40 ½
Chesterman's.....Regular list dis 30 @ 25 ½

Thermometers.
Tin Case.....dis 80 ½

T-n-som Lifters.
Washburn Patent.....dis 35 ½
Rether, Imp. Lifter, list, Oct., 1882.....dis 35 ½
Excelsior.....dis 50 1/10 ½

Tool-co Cutters.
Enterprise Mfg. Co. (Champion).....dis 30 1/10 ½
Wood Bottom.....\$ doz \$10.00, dis 30 1/10 ½
All Iron.....\$ doz \$4.50, dis 30 1/10 ½
Acme.....\$ doz \$18.00, dis 50 1/10 ½
Wilson's.....\$ doz \$24, dis 50 1/10 ½
Clipper (Sargent & Co.).....\$ doz \$24, dis 50 1/10 ½

Timber Tools and Machines.
Machines (P. S. & W.).....list add 20 ½
Tools (P. S. & W.).....add 0 ½

Trips.
Game, Newhouse.....dis 35 ½
Game, Onella Patent.....dis 40 1/10 ½
Game, Blake's Patent.....dis 40 1/10 ½
Mouse, Wood, Choker.....dis 10 ½
Mouse, Round Wire.....\$ doz \$1.50, dis 10 ½
Mouse Cage, Wire.....\$ doz \$2.50, dis 10 ½
Mouse Catch—em alive.....\$ gross \$10 net
Mouse, "Bonanza".....\$ gross \$18.00, dis 20 ½
Mouse, Delusion.....\$ doz \$10.00, dis 10 ½
Rat, "Decor".....\$ doz \$10.00, dis 10 ½

Trowls.
Lottrop's Brick and Plastering.....dis 25 ½
Read's Brick and Plastering.....dis 15 ½
Dixton's Brick and Plastering.....dis 15 ½
Peace's Plastering.....dis 25 ½
Clement & Maynard's.....dis 20 ½
Rose's Brick.....dis 20 ½
Brade's Brick.....dis 25 ½
Worrall's Brick and Plastering.....dis 20 ½
Garden.....dis 50 ½

Triers.
Butts and Cheese.....dis 25 ½

Trucks, Warehouse, &c.
Penfold Block Co.'s list, 1882.....dis 40 ½

Twine.

		BC.	B.
No. 12, Flax Twine, ¼ and ½ m Balls.....	18 ½	30 ½	....
No. 18, " " ¼ and ½ m ".....	17 ½	18 ½	....
No. 36, " " ¼ and ½ m ".....	17 ½	18 ½	....
No. 204, Mattnass, ¼ and ½ m Balls.....	18 ½	30 ½	....
Chalk Line, Cotton, ¼ m Balls.....	18 ½	30 ½	....
2-Ply Hemp, ¼ and ½ m Balls (Spring Twine).....	18 ½	30 ½	....
3-Ply " 1 m Balls.....	18 ½	30 ½	....
Cotton Wrapping, 5 Balls to m.....	18 ½	30 ½	....
2, 3, 4, and 5 Ply Jute, ¼ m Balls.....	18 ½	30 ½	....
Cotton Mops—6, 9, 12 and 15 m to dos.....	17 ½	18 ½	....

V Solid Box.....dis 50 ½
Solid, Peter Wright's.....10 ½

THE JENNINGS & GRIFFIN
MANUFACTURERS
Mechanics' Tools and
SOLE PROPRIETORS
THE L'HOMMEDIU
The Oldest Auger
ESTABLISHED BY JOSHUA

In ordering Ship Augers be sure that they are for "Watrous & Co.," as these are the only brands are fully warranted by us.

C. E. JENNINGS
96 CHAMBERS STREET

Jewett's Climate
A GOOD

The Reserved

We invite you to try our ware, Tinware, of handling and excellent

CLIMATE

the two-gallon sizes at proportionate prices. The Trade agree to earn the good-will by employing them by sought for their greatest necessity. **Pure Water** as our popular much the largest

SEND FOR CATALOGUE

JOHN C. JEWETT
BUFFALO
Manufacturers of Refrigerators, Ventilators, &c.

Good as

Shot
PAPER, THIRD
EST, 8, 10, 12, 14, 16 gauge.
THIRD, 10 and 12

will have "Wesson Copper Primers" to all others. H

BOTTOM

THE ALFORD & DEER
P. O. Box 2002.

POST'S
Waterproof Belt Oil
and Leather
Preservative,
FOR WET AND DRY LEATHER
BELTING.

TRADE MARK.
P O S T

Registered in the U. S. and Great Britain.

The Standard Belt
Oil of the
World.

Leather dressed with this oil will not crack or rot, as heat, cold, water or gas has no effect on it. It will spread one-third further and last much longer than any oil for the same purpose. It never turns rancid; will keep in any climate. Belts may be run in water at one end and a hot room at the other, and still be soft, dry and pliable. Warranted not to start glue-laps or gum on belts or pulley, and to keep the surface perfectly smooth.

Beware of Imitations Sold at a
Discount.

THE ALFORD & BERKELE COMPANY
P. O. Box 2002, 77 Chambers Street, New York.

No. 10 Peck Slip, New York,
SOLE MANUFACTURERS.

WHOLESALE METAL PRICES, September 10, 1884.

METALS.

IRON.—Duty: Bars, 8-10¢ to 11-10¢ per lb.; provided that no less shall pay a less rate of duty than 35¢. Sheet, 11-0¢ to 15-10¢ per lb. Band, Hoop and Scroll, 1¢ to 1-4-10¢ per lb. Railroad Bars weighing more than 25 lb per yard, 7-10¢ of 1¢ per lb.

Standard American Pig Iron.

Foundry No. 1 X..... per ton \$20.00 @ 21.00
Foundry No. 2 X..... per ton 18.50 @ 19.00
Gray Forge..... per ton 17.00 @ 18.00

No. 1 Scotch Pig Iron.

Carnegie..... per ton 20.50 @ 21.50
Cottrell..... per ton 21.00 @ 22.00
Shotts..... per ton 21.50 @ 22.50
Glenbrook..... per ton 21.00 @ 22.00
Langdon..... per ton 21.50 @ 22.50
Summerlee..... per ton 20.75 @ 21.00
Dalmellington..... per ton 19.25 @ 19.50
Eglington..... per ton 20.00 @ 21.00
Glyde..... per ton 20.00 @ 21.00

Rails.

Steel, at Eastern mills..... per ton 27.00 @ 28.00
Old Rails, Tn..... per ton 18.00 @ 18.50

Scrap.

Wrought, per ton, from yard..... 19.00 @ 20.00

Bar Iron from Store.

Common Iron:
¾ to 1 in. round and square..... per lb 2 @ 2.10¢
1 to 6 in. x ¾ to 1 in..... per lb 2 @ 2.10¢

Refined Iron:
¾ to 1 in. round and square..... per lb 2 @ 2.10¢
1 to 6 in. x ¾ to 1 in..... per lb 2 @ 2.10¢

Rods—¾ and 1-10 round and sq..... per lb 2 @ 2.50¢
Bands—1 to 12-10 to No. 12..... per lb 2 @ 2.50¢

"Burden's Best" Iron, base price..... per lb 2 @ 2.50¢
"Burden's" H. B. & S. Iron, base price..... per lb 2 @ 2.50¢

Norway Nail Rods..... per lb 2 @ 2.50¢

Sheet Iron from Store.

Common American..... per lb 2 @ 2.50¢
R. G. Cleaned..... per lb 2 @ 2.50¢

Nos. 10 to 15..... per lb 2 @ 2.50¢
17 to 20..... per lb 2 @ 2.50¢

21 to 24..... per lb 2 @ 2.50¢
25 and 30..... per lb 2 @ 2.50¢

27..... per lb 2 @ 2.50¢
28..... per lb 2 @ 2.50¢

Galvanized, 10 to 20..... per lb 2 @ 2.50¢
Galvanized, 21 to 24..... per lb 2 @ 2.50¢

Galvanized, 25 to 30..... per lb 2 @ 2.50¢
Galvanized, 31..... per lb 2 @ 2.50¢

Galvanized, 32..... per lb 2 @ 2.50¢
American Russia..... per lb 2 @ 2.50¢

Russia..... per lb 2 @ 2.50¢
American Cold Rolled B. B..... per lb 2 @ 2.50¢

Iron Wire. See Wire.

STEEL.—Duty: Ingots, Bars, Sheets, &c., valued at 4¢ per lb. or less, 45¢ ad. val.; valued above 4¢ and not above 7¢ per lb., 2¢ per lb.; valued above 7¢ and not above 10¢ per lb., 2½¢ per lb.; valued above 10¢ per lb., 3½¢ per lb. Extra Cold Bars, Rods, &c., cold hammered or polished, in any way in addition to ordinary hot rolling, 1½¢ per lb. in addition to above; Steel Circular Saw Plates, 1¢ per lb. in addition to the above.

American Cast Steel.

For American Steel, see Pittsburgh quotations.

English Steel.

Best Cast..... per lb 15¢ @ 15½¢
Extra Cast..... per lb 16¢ @ 16½¢

Circular Saw Plates..... per lb 10¢ @ 10½¢
Round Machinery, Cast..... per lb 10¢ @ 10½¢

Swaged, Cast..... per lb 10¢ @ 10½¢
Best Double Shear..... per lb 10¢ @ 10½¢

Blister, 1st quality..... per lb 14¢ @ 14½¢
German Steel, Best..... per lb 9¢ @ 9½¢

3d quality..... per lb 8¢ @ 8½¢
Sheet Cast Steel, 1st quality..... per lb 15¢ @ 15½¢

2d quality..... per lb 14¢ @ 14½¢
3d quality..... per lb 13¢ @ 13½¢

TIN.—Duty: Bars, Block and Pig Iron..... per lb 2 @ 2.50¢
Banca..... per lb 2 @ 2.50¢

Straits..... per lb 2 @ 2.50¢
English..... per lb 2 @ 2.50¢

Bar..... per lb 2 @ 2.50¢

Charcoal Tin Plates.

1 C 10x14..... per box \$5.50 @ \$6.25
1 C 12x12..... per box 12.00 @ 13.00

1 C 20x25, 1..... per box 7.00 @ 8.00
1 C 12x12..... per box 7.00 @ 8.00

1 C 14x20, 112..... per box 7.00 @ 8.00
1 C 12x12, 100..... per box 5.25 @ 5.75

1 C 10x30, gutters, 225 sheets..... per box 7.25 @ 7.75
For each additional X add..... 1.50

Coke Tin Plates.

Best..... per box \$5.50 @ \$5.20
Ordinary..... per box \$5.00 @ \$5.20

1 C 10x14..... per box 5.25 @ 5.75
1 C 12x12..... per box 5.25 @ 5.75

1 C 10x30, gutters, 225 sheets..... per box 7.25 @ 7.75
1 C 20x25, 112 sheets..... per box 10.50

Terne Plates.

Prime Char. 3d quality..... per box \$7.00 @ \$7.50
1 C 14x20 Trengrove, Old Process..... per box 14.50 @ 15.00

1 C 20x25..... per box \$4.75 @ \$4.87½
1 C 14x20..... per box 7.00 @ 7.50

1 C 20x25..... per box 9.00 @ 9.75
1 C 20x25..... per box 10.00 @ 10.75

1 C 20x25..... per box 13.50 @ 14.00

Tin Boiler Plates.

1 C 14x20, 2 sheets for No. 7, 112 sheets..... per box \$13.50 @ \$14.00
1 C 14x20, 2 sheets for No. 8..... per box 14.50 @ 15.00

1 C 14x20, 2 sheets for No. 9..... per box 16.00 @ 16.50

COPPER.—Duty: Pig, Bar and Ingot, 4¢; Old Copper, 3¢. Manufactured (including all articles of which Copper is a component of chief value), 35¢ ad. valorem.

Ingot, Lake..... per lb 15¢ @ 15½¢
Ingot, Baltimore..... per lb 14¢ @ 14½¢

Brazers' Copper, ordinary sizes..... per lb 22¢ @ 24¢
Brazers' Copper, ordinary sizes..... per lb 22¢ @ 24¢

under 16 oz. and over 12 oz. per sq. ft..... per lb 24¢ @ 26¢
Brazers' Copper, 10 oz. and 12 oz. per sq. ft..... per lb 27¢ @ 29¢

Lighter than 10 oz. per sq. ft..... per lb 29¢ @ 31¢
Circles less than 54 in. in diam..... per lb 35¢ @ 37¢

84 in. diam. and over..... per lb 35¢ @ 37¢
Segment and Pattern Sheets..... per lb 35¢ @ 37¢

Locomotive Fire-Box Sheets..... per lb 35¢ @ 37¢
Sheathing Copper, over 12 oz. per sq. ft..... per lb 19¢ @ 21¢

Boiler Copper..... per lb 19¢ @ 21¢
Copper Bottoms..... per lb 19¢ @ 21¢

Nickel-Plated Sheathing..... per lb 35¢ @ 37¢
Flat Copper Boiler Bottoms or Pit Bottoms, cut to special sizes..... per lb 35¢ @ 37¢

Tinning.

14x48, by the case..... per sheet, 5¢ @ 5.50¢
14x48, less than case..... per sheet, 5¢ @ 5.50¢

For tinning both sides, double the above amount.

0'Neill's Patent Planished Copper, Net..... per lb 34¢ @ 36¢
2 and 16 oz. and heavier..... per lb 34¢ @ 36¢

12 oz. and lighter..... per lb 34¢ @ 36¢

Boiler Plates.

7 in., 14x52, 9 in., 14x50..... per lb 30¢ @ 32¢
14 and 16 oz. and heavier..... per lb 30¢ @ 32¢

(And all sizes not over 20 in. wide.)
14 and 16 oz. and heavier..... per lb 30¢ @ 32¢

12 oz. and lighter..... per lb 30¢ @ 32¢

Copper Wire. (See Wire.)

Sheathing Metal.

ellow Sheathing Metal..... per lb 30¢ @ 32¢

BRASS AND GERMAN SILVER.

Brown & Sharpe's Gauge the Standard for Metal;
Old English Gauge the Standard for Wire.

Brass Manufacturers' Price List, January 17, 1884..... per lb 30¢ @ 32¢

LEAD.—Duty: Pig, 5¢ per 100 lb.; Old Lead, 2¢ per 100 lb.; Pipe and Sheet, 3¢ per lb.

American..... per lb 4¢ @ 4½¢
Pipe..... per lb 4¢ @ 4½¢

Block Tin Pipe..... per lb 15¢ @ 20¢
Tin Lined Pipe..... per lb 15¢ @ 20¢

Sheet..... per lb 6½¢ @ 8¢
Shot..... per lb 6½¢ @ 8¢

Chilled Shot..... per lb 6½¢ @ 8¢

ANTHONY.
Hallett's..... per lb 11¢ @ 11½¢
Cookson..... per lb 11¢ @ 11½¢

SPELTER.—Duty: Pigs, Bars and Plates, \$1.50 per 100 lbs.

American, cash..... per lb 4½¢ @ 5½¢
Bergenport..... per lb 4½¢ @ 5½¢

ZINC.—Duty: Pig or Block, \$1.50 per 100 lbs.

Sheet, 24½¢ per lb..... per lb 5.70¢ @ 6.30¢
600 lb casks..... per lb 5.70¢ @ 6.30¢

Zinc—Open..... per lb 5.70¢ @ 6.30¢
Zinc Tubing—Dis. 25¢..... per lb 5.70¢ @ 6.30¢

Plain..... per lb 27¢ @ 33¢
Fancy..... per lb 27¢ @ 33¢

Scotch and Extra Patterns..... per lb 27¢ @ 33¢

HABBITT METAL.
N. P. U..... per lb 7½¢ @ 7¢
A. 25¢; B. 25¢; C. 14¢.

WIRE.
Iron Wire.—Put up in 63 lb bundles.
Nos. 00 to 9, 10, 11, 12, 13, 14, 15, 16, 17, 18.

Bright Market Wire..... per lb 65¢ @ 67¢
"Bale Wire, Nos. 7 to 12..... per lb 47¢ @ 49¢

Annealed Market Wire..... per lb 65¢ @ 67¢
"Fence Wire, Nos. 8 and 9..... per lb 65¢ @ 67¢

"Grape Wire, Nos. 10 to 14..... per lb 57¢ @ 60¢
"Best Steel Wire..... per lb 57¢ @ 60¢

Coppered Market Wire..... per lb 60¢ @ 62¢
"Bale Wire, Nos. 7 to 12..... per lb 60¢ @ 62¢

Galvanized Market Wire..... per lb 50¢ @ 52¢
"Fence Wire..... per lb 50¢ @ 52¢

Stone or Weaving Wire.
Nos. 16 to 18..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 19 to 21..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 22 to 24..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 25 to 27..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 28 to 30..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 31 to 33..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 34 to 36..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 37 to 39..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 40 to 42..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 43 to 45..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 46 to 48..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 49 to 51..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 52 to 54..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 55 to 57..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 58 to 60..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 61 to 63..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 64 to 66..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 67 to 69..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 70 to 72..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 73 to 75..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 76 to 78..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 79 to 81..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 82 to 84..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 85 to 87..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 88 to 90..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 91 to 93..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 94 to 96..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 97 to 99..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 100 to 102..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 103 to 105..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 106 to 108..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 109 to 111..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 112 to 114..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 115 to 117..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 118 to 120..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 121 to 123..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 124 to 126..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 127 to 129..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 130 to 132..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 133 to 135..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 136 to 138..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 139 to 141..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 142 to 144..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 145 to 147..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 148 to 150..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 151 to 153..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 154 to 156..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 157 to 159..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 160 to 162..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 163 to 165..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 166 to 168..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 169 to 171..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 172 to 174..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 175 to 177..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 178 to 180..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 181 to 183..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 184 to 186..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 187 to 189..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 190 to 192..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 193 to 195..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 196 to 198..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 199 to 201..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 202 to 204..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 205 to 207..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢
Nos. 208 to 210..... per lb 23¢ @ 25¢

Cents..... per lb 23¢ @ 25¢

Ferromanganese Made at Pittsburgh.

During the last two or three weeks, says the *American Manufacturer*, Blast Furnace A of the Edgar Thomson Steel Works has been producing ferromanganese, instead of spiegelisen, as formerly. On Monday last we were shown a specimen of this ferromanganese, which contained a small fraction over 92 per cent. of manganese. The ore is obtained from the Crimora Mine, in Augusta County, Va., which is owned by Jas. B. White & Co., of Pittsburgh. The mine is 2 miles from Crimora Station, Shenandoah Valley Railroad. The quantity of ore raised during August was 1000 tons. The company have sunk a new shaft, which is 140 feet, and will be furnished with modern hoisting apparatus. The old shaft is 130 feet deep, and the ore is raised by means of buckets. Appended is a table giving an analysis of this ore, as made by Andrew S. McCreath, of the Pennsylvania Geological Survey:

Binoxide of manganese.....	81.708
Protoxide of manganese.....	7.281
Sesquioxide of iron.....	.553
Oxide of cobalt.....	.354
Oxide of nickel.....	.066
Oxide of zinc.....	.023
Oxide of copper.....	None
Alumina.....	.896
Baryta.....	.329
Line.....	.880
Magnesia.....	.630
Sulphuric acid.....	None
Phosphoric acid.....	.171
Alkalies.....	.467
Water.....	3.045
Silica.....	2.132

Total.....100.000
Metallic manganese.....57.291
Metallic iron......373
Phosphorus......075

The company have been shipping their ore to England for two years or more, and now also ship to Belgium. They commenced shipping to the Cambria Iron Company, about 18 months ago, and have been shipping to Pittsburgh about a year. Besides supplying their own steel plant (the Edgar Thomson) with ferromanganese, Carnegie Bros. & Co., Limited, are also supplying some of the open-hearth furnaces hereabouts. With one exception, we believe that Furnace A is the only blast furnace in the United States that has made ferromanganese. The exception is Diamond Furnace, in Georgia, which a few years ago made ferromanganese, but according to our recollection the product was not near so rich in manganese as that made at the Pittsburgh furnace.

LATEST LEGAL DECISIONS.

CORPORATION—PROMISSORY NOTE GIVEN IN SUBSCRIPTION FOR CAPITAL STOCK.

H gave his note for his subscription to the capital stock of a company, and S bought it after it became due. H, in making his defense, claimed that he was not liable, on the ground that, as the whole capital stock had not been taken, he could not be held for his subscription. Not more than one-third of the shares were subscribed for. The trial court decided in favor of S, and H took the case—Hale vs. Sanborn—to the Supreme Court of Nebraska, where the judgment was reversed. Judge Maxwell, in the opinion, said: "Where the capital stock is fixed at a given sum, divided into shares of a certain amount each, the capital so fixed must be fully subscribed before an action will lie against a subscriber to cover assessments levied on the shares of the stock, unless there is a clear provision in the contract to proceed with the accomplishment of the main design with a less subscription than the whole amount of the capital specified, or there is a waiver of the condition precedent. There is reason in this requirement. The enterprise which would require \$40,000 to carry it on successfully would not, in all probability, succeed with a capital of one-third or one-half of that amount. Consequently, the agreement is that the entire amount shall be subscribed before the enterprise is undertaken. The note in this case was transferred after it became due, and the holder of it possesses no greater rights thereunder than the corporation had. If there are facts existing which show a waiver, or any liability of the maker, they must be pleaded."

FIRE INSURANCE—PAYMENT OF PREMIUM—FORFEITURE.

In an action upon a fire policy the company set up the defense that as the last premium was not paid upon the day it was due, as required by the policy—as follows: "It is provided that if the insured shall fail to pay the premium note on or before it becomes due, the contract and policy of insurance shall thereby become void"—all claim under the policy was forfeited. It appeared upon the trial that the note was not surrendered upon the default in payment, and that it was afterward paid, the company accepting the money. The company was defeated and took the case—Phoenix Insurance Company vs. Lansing—to the Supreme Court of Nebraska, where the judgment was affirmed. Judge Maxwell, in the opinion, said: "The company did not surrender the note when it became due, but retained it and afterward collected it. This was the consideration of the insurance. Now, if the company receives and retains the premium, can it, as a defense to an action on a policy to recover for the loss of the property insured, allege a failure to pay promptly at the day. The acceptance of the money is a waiver of any default in that respect. The policy was not void, but voidable, and upon the failure of Lansing to pay the note when it became due the company could have returned the note and demanded the surrender of the policy. But it cannot treat the policy as valid to collect the premium, and void for the payment of the loss."

PARTNERSHIP—PAYMENT OF PARTNER'S DEBT—CONSIDERATION—GENERAL CONSIDERATION.

One of a firm owed a bank some money, and the firm paid this debt upon the condition that that member should continue in the partnership. Shortly afterward the firm made a general assignment, and the creditors sued the bank to recover the money paid to it, claiming that the payment was in fraud of their rights. The creditors were defeated, and the case—George vs. Walmsley—was carried to the Supreme Court of Iowa, where the judgment was affirmed

Judge Buck, in the opinion, said: "The bank cannot be charged with acting in bad faith. It simply secured its debt. The bank had no notice of the insolvency of the firm, and had the right to rely on the statement made by the partners that if the member remained in the firm, as he agreed to do, they would be able to pay all their debts. We have held that the property of a firm may, for a valuable consideration, be transferred to a partner, and be held by him free from the partnership debts. In the case before us, the money of the firm was used in payment of the debts of H, the member mentioned. It was, in fact, the transfer of money of the firm for his benefit, and it is not different in its effect and nature from a sale and transfer of firm property directly

Morse was built in England in 1866 expressly for telegraph work, and named the Suffolk. She was wrecked in 1874 on the Florida reefs, gotten off, and subsequently bought by the Western Union Telegraph Company, who had her taken to Baltimore, refitted at a cost of \$70,000, and had her name changed to the Professor Morse. Then she went into the coal trade, was wrecked, raised and put in the fruit trade, and now she is in the coal trade again.

HARDWARE NOVELTIES.

Chime Sleigh Bells.

The Russian and Swiss Chime Sleigh Bells, made by the Chapman Manufacturing Com-

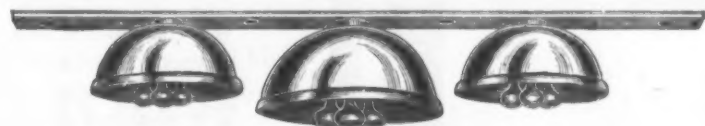


Fig. 1.—Swiss Chime Shaft Sleigh Bells.

to him. The only question, then, is, Was there a sufficient consideration from H to support the transaction? The consideration of the transaction was that H should remain in the firm instead of withdrawing his interest and paying his debts. The inducement to the arrangement was the expectation and belief that through it the firm would be able to pay their debts, which they would not be able to do if the capital and experience of H were withdrawn. We think that the agreement of H to continue in the firm was a sufficient consideration,

pany, of Meriden, Conn., were introduced into this country in 1878. The trade in them, which was at first confined to a few large cities, has, it is said, steadily increased since then. These chimes are made in various patterns, varying from the cheapest to the most expensive. Fig. 1 represents a chime made from pure bell metal, each bell having three tongues; it is finished with either nickel, gold or brass plating, and is one of the cheaper patterns. There are various other chimes of this style adapted for fastening to the shafts, but differing in



Fig. 2.—Sexton's Patent Shaft Sleigh Bells.

and that the transaction, therefore, was not voluntary and in fraud of the creditors' rights.

CHATEL MORTGAGE—PROPOSED SALE—INJUNCTION.

Certain personal property was mortgaged, and the debt was not paid. The mortgagee did not take possession of the property, but when he learned that the mortgagee was about to sell the property he applied for and obtained an injunction to restrain the sale. The mortgagee appealed the order—Minnesota Linseed Oil Company vs. Maginnis—to the

the number and size of bells and in the quality of finish. Fig. 2 represents a new chime, just introduced this season, which is fastened to the side of the shaft instead of under. These chimes are warranted to be in perfect tune to the chord of E, with the notes E, G sharp, B, E in the musical scale. Fig. 3 which is a large Swiss saddle-chime for double teams is an example of a class of bells which are made in different form and size for single horses and teams. The bells shown in the cut are tuned the same as those in Fig. 2. The saddle-chimes, it is



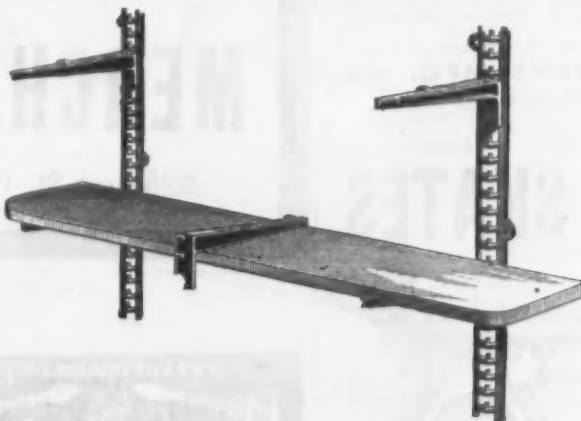
Fig. 3.—Swiss Saddle Chime Sleigh Bells.

Supreme Court of Minnesota, where it was reversed. The Chief Justice (Gilfillan), in the opinion, said: "The plaintiff had the right, after condition, to take possession of the property, and he could have enforced this right of replevin. For the mere preservation of the property, and to prevent its being disposed of by the mortgagee, there was no necessity for the injunction, for there was a more adequate and speedy remedy by the action of replevin, if possession of the property was refused. And an injunction will not issue where there is a complete and

said, are very easy to put on or take off the saddle of the harness, as they are held in place by the two terrets. In connection with the chime sleigh bells, the Chapman Manufacturing Company also manufacture all kinds of horsehair plumes.

The Kelly Patent Adjustable Shelving.

The Kelly Patent Adjustable Shelving, as shown in the illustration, needs little description and is evidently simple in construction,



The Kelly Patent Adjustable Shelving.

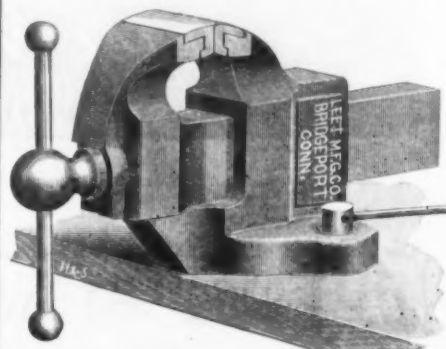
speedy remedy for an ordinary action. Had the plaintiff brought its action to enforce the lien by foreclosure of the mortgage, as it might have done, a temporary injunction to restrain the threatened sale might have been proper, for the sale would have tended to render the judgment ineffectual.

The twin-screw steamship Professor Morse, well known in connection with cable-laying, is now lying at the Consolidation Coal Company's pier, Baltimore, by which company she has been chartered as a collier. The

provided with slots into which the bracket fits, the pin shown in the slots holding it immovable and preventing displacement by jarring. The device is made entirely of air-furnace malleable iron, and it is claimed, possesses great strength. Four feet space between the uprights is sufficient for ordinary use, while for heavy goods, by making them stronger and placing them closer, the shelves will hold any desired weight. The erection of the shelves is simple, the uprights being made in sections, so arranged as to be accurately fitted to each other, and re-erection being, therefore, easily effected. The shelves can be adjusted to any distance from 4 inches apart upward. In addition to these advantages the manufacturers call special attention to the important saving in the expense of shelving which results from the use of this device. It is manufactured by the St. Louis Malleable Iron Company, 2111 Market street, St. Louis, Mo.

Patent Sliding-Jaw Bench Vise.

A new bench vise has just been brought out by C. D. Leet, of Bridgeport, Conn., its peculiar construction, however, being due to a suggestion of Wm. H. Northall, of the same place. The tool, Fig. 1, may be briefly described as a screw vise, so designed as to be capable of being slid to the required opening in a moment, and then made to grip its work securely, or else used as an ordinary screw vise. The screw is square on the strain side, flat on top and beveled



Leet's Patent Vise.—Fig. 1.—General View.

at the back, which form is intended to give greater strength with less material. This shape, it is claimed, is far superior to the usual square thread, as it permits a finer pitch, and therefore a more powerful grip to be taken on the work, with less sudden strain. The screw is so placed that its pull is in a direct line with the nut, which is drawn against the lug and forms a part of the shoe of the vise, and thus the nut, which has a little end play, acts like a jamb nut, being drawn against a fixed abutment. The grip, it is said, holds under the severest tests and prevents the great loss of time con-

than the surface covering. The construction having been influenced by the consideration of cost and the service for which the railroad is destined, for the special use of the Juragua mines, there was no reason why the line should not follow, as much as possible, the irregularities of the ground; in order not to unduly increase the grades, the line has adapted itself to all the changes of direction required by the lay of the land, rounding the angles by means of curves, and, in a word, adjusting the line to all the capricious irregularities of the ground, so as to avoid the higher acclivities and

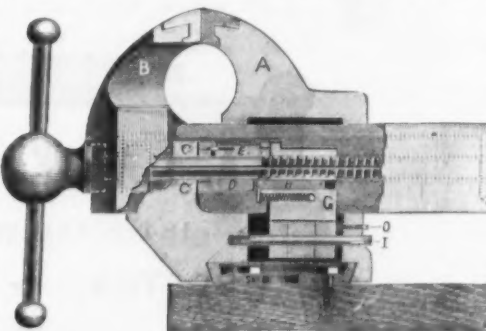


Fig. 2.—Sectional View.

sequent upon the workman having frequently to tighten up on his work. The bar and head have ample metal where it is most required, and the fact that all its finished parts are brought to gauges and its working parts made of steel insures interchangeability and wearing power and lessens cost of repairs.

The mechanism on which depends the working of this vise is a split nut, which is opened or closed by turning the screw to the right or left, Fig. 2. In turning the lever to

feet; this, with a total length of 800 feet, gives more than necessary space for the passage of the waters. The iron pillars rest upon piers and piles of pine timber, cross-sotted.

There are, besides, along the whole of the line, numerous wooden bridges of considerable height, some of them constructed on a curve, of which may be mentioned as most important those on the rivers Carpintero, Estero de Juraguacito, Jutici and Sardinera. There are also innumerable smaller bridges, culverts and ducts for the drainage of the road. Along the entire road a telegraphic line has been established, with stations at Juraguacito, Juraguacito and La Cruz. A temporary wooden dock has been constructed for loading the ores at the Enseñada de la Cruz.

Science and Sound Practice.

—In an article on the prospects of young engineers the *London Engineer* thus alludes to the necessity of combining practical knowledge with scientific attainments in order to achieve commercial success: "We often hear German and French engineers extolled for the results of their scientific training. What are the locomotives or marine engines which have resulted from it like? The Americans have been the least scientific engineers in the world, yet they have modified engine-building practice all over the world. Germany and France have been unable to compete with us without buying engines from us to copy. Science may prevent a man from making enormous mistakes; it cannot tell him how to produce even moderate commercial successes. Standing alone it is entirely helpless in commercial mechanical engineering—combined with sound practice it is useful."

There are now in the United States 16 locomotive works, not including the shops owned by railway companies. Pennsylvania has five of these, New Jersey and Massachusetts three each; New York, two; and Rhode Island, New Hampshire and Maine one each. These works give employment to 14,000 men, and every year add about 2600 locomotives to the 20,000 now in use.

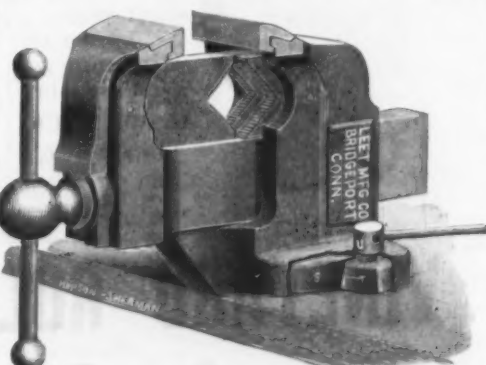


Fig. 3.—Pipe Vise.

the left the pawl in Fig. 2 drops into the spine of the screw and rotates the cam sleeve D, which forces the wedge and locking device H back, opening the nut G, thus allowing of the jaw B to slide. In turning the lever to the right a spring forces the wedge and locking device H back into position, thus closing and locking the nut. Turning in the small screw O locks the nut permanently, and thus transforms the vise from a sliding jaw to a common screw vise. In the swivel are combined a wedge and screw, and the perfect control which the operator has over this part of the vise is spoken of as a great advantage.

The turning of the screw U shown in cut of pipe's vise, Fig. 3, draws up or forces out the wedge T between the inclines on the swivel-plate S and in the interior of the base, thus holding the vise perfectly rigid in any position or releasing it in a moment.

Handling Coal by Machinery.—In Wales very efficient machinery has been designed for the purpose of expediting the loading of coal cargoes. At the Bute Docks, Cardiff, there is a large quantity of coal handled, and there are 42 balance and hydraulic "tips." Each tip is capable of shipping 1000 tons of coal per working day; the total shipping capacity of the Bute Docks is therefore equal to nearly 12,000,000 tons of coal per annum. In some instances as much as 200 tons of coal have been shipped per hour at the hydraulic tips, and it is now not uncommon for a steam collier of 2000 tons burden to enter the basin at high water of one day, discharge her ballast, receive her outward cargo and leave at high water the following day, the entire operation having occupied less than 24 hours.

CONTENTS.

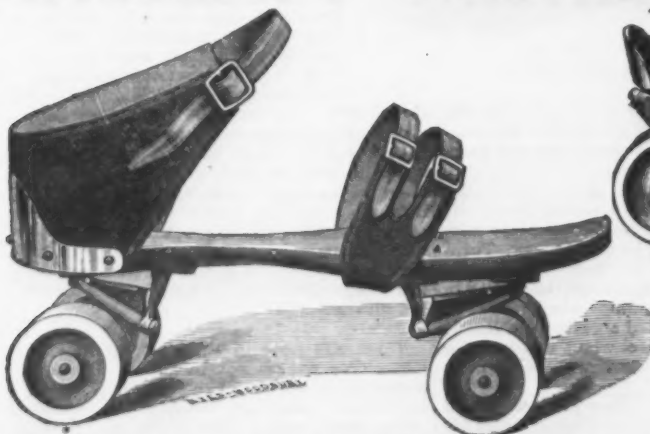
	PAGE.
The Ebbw Vale Iron and Steel Works. Illustrated.....	1
Manufactures in Indianapolis.....	7
Bessemer Steel Supplanting Other Kinds.....	7
New Inventions.....	9
A New Lake Revenue Cutter.....	9
Boiler Explosions and Inspections in Great Britain.....	11
Novel Application of Wind Power.....	11
How to Cool a Room in Summer.....	11
New Blacksmiths' Tools. Illustrated.....	13
An Ocean-Going Steam Dredger.....	13
French Coal Briquettes.....	13
Forms of Strength and Efficiency in Steam-Boiler Construction.....	15
Trade Publications:	
The Armstrong & Sims Engine Company.....	15
Recording Gauges.....	15
Steam Pumps.....	15
Feed-Water Heaters.....	15
Editorial:	
The Bureau of Labor Statistics.....	16
The Reading Railroad Policy.....	16
Steel-Rail Makers and Their Workmen.....	16
The Labor Troubles in the Mining Districts.....	16
Triumph of Steam Over Ancient Dogma.....	16
Negotiable Paper.....	17
The American Institute of Mining Engineers. Illustrated.....	17
The Iron Age Directory.....	19
Trade Report:	
British Iron and Metal Markets.....	21
Financial.....	21
Metal Market.....	21
Coal.....	21
Old Metals, Rags, &c.....	21
Philadelphia.....	22
Pittsburgh.....	22
Chicago.....	22
Chattanooga.....	22
Cincinnati.....	22
St. Louis.....	22
Louisville.....	22
Baltimore.....	22
Imports and Exports.....	22
General Hardware.....	24
New York Iron Market.....	25
Metal Exchange.....	25
Foreign Markets.....	27
Industrial Items.....	29
Washington News.....	35
Breaking Up a Monitor.....	35
English Letter.....	37
New York Wholesale Hardware Prices.....	38
New York Wholesale Metal Prices.....	39
Ferromanganese Made at Pittsburgh.....	31
Latest Legal Decisions.....	31
Hardware Novelties:	
Chime Sleigh Bells. Illustrated.....	31
The Kelly Patent Adjustable Shelving. Illustrated.....	31
Patent Sliding-Jaw Bench Vise. Illustrated.....	31
The Juragua Iron Company's Railroad.....	31
Science and Sound Practice.....	31
Handling Coal by Machinery.....	32
The Ballantine Refrigerating Plant. Illustrated.....	37
Metric Nomenclature.....	37
Hydraulic Power Distribution in Cities.....	37
Proposed Canal Through Ireland.....	37
Philadelphia and Pittsburgh Hardware and Metal Prices.....	43
Boston Hardware and Metal Prices.....	44

NORTH WESTERN HARDWARE CO.,
92 Lake St., Chicago, Ill.
HARDWARE SPECIALTIES.

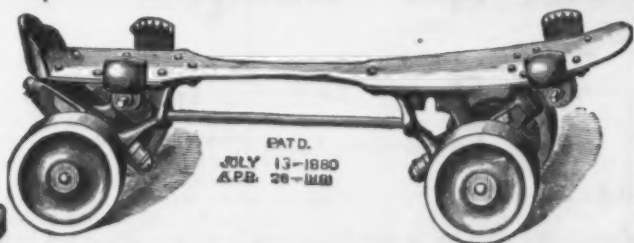
AGENTS FOR
Buckthorn Fence Wire, Champion Roller Skates, Wihide Tra.s. Halifax Pattern Star Club Skates.

We offer balance of Acme Skates at low prices, to close stock. We will have full stock of Star Club Skates next month, which are same style and finish, and equal in every respect to Acme Skates.

WINSLOW'S VINEYARD ROLLER SKATES.



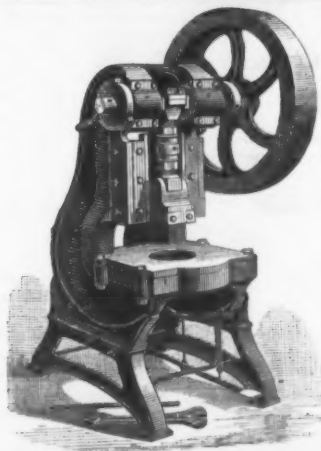
Frank E. Winslow,



THE STANDARD ROLLER SKATES OF THE WORLD.

These Skates are in use in over 2000 Rinks, and in every instance afford the fullest satisfaction. Address all orders and inquiries to
St. James Avenue and Clarendon Street,
BOSTON, MASS.

E.W. BLISS'S PRESSES & DIES.



No. 21 ADJUSTABLE PRESS.

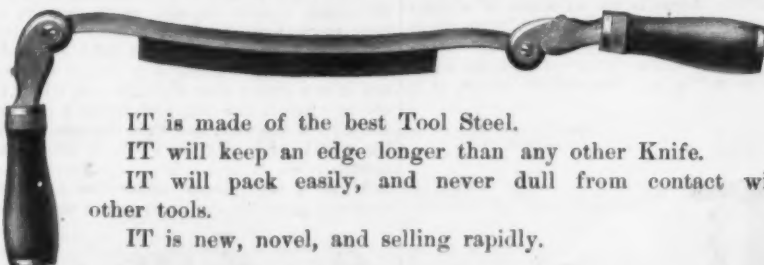
SPECIAL MACHINERY FOR TIN & SHEET METAL WORKERS
PLYMOUTH, PEARL & JOHN ST'S. } **BROOKLYN, N.Y.**

The Attention of the Hardware and Tool Trade is called to our

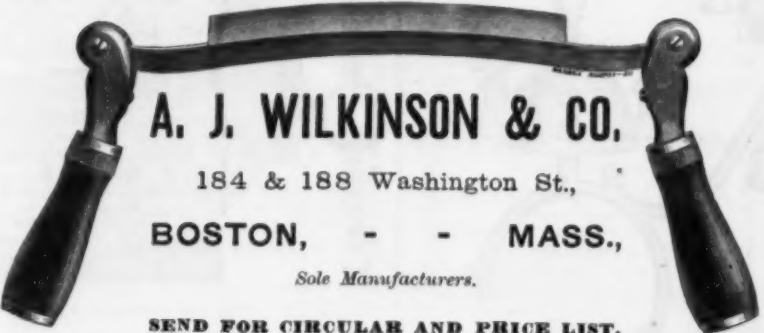
Folding and Adjustable Handle



DRAW KNIFE



IT is made of the best Tool Steel.
IT will keep an edge longer than any other Knife.
IT will pack easily, and never dull from contact with other tools.
IT is new, novel, and selling rapidly.



A. J. WILKINSON & CO.

184 & 188 Washington St.,

BOSTON, - - MASS.,

Sole Manufacturers.

SEND FOR CIRCULAR AND PRICE LIST.

PENN LOCK WORKS, Phil.



BRASS PADLOCKS
Of Every Description.
HEAVY BRASS
SWITCH AND
CAR PADLOCKS
A SPECIALTY.
G. W. NOCK,
142 North 4th St.,
PHILADELPHIA.

H.W. JOHNS' ASBESTOS

LIQUID PAINTS, ROOFING,

FIRE-PROOF BUILDING FELT,
Steam Pipe and Boiler Coverings, Steam Packings,
Mill Board, Gaskets, Sheathings, Fire-Proof
Coatings, Cements, &c.

DESCRIPTIVE PRICE LIST AND SAMPLES FREE.
H. W. JOHNS MFG. CO.,
87 Maiden Lane, New York.

MERCHANT & CO.'S
GUARANTEED ROOFING PLATES.

"CAMARET" ROOFING.

We guarantee the "Camaret" as follows, or to be held subject to our order, we agreeing to take back the boxes if in the same condition that we ship them:

We guarantee "Camaret" roofing plate to double-seam under all conditions, and to stand any test of bending, or working, that arises in roofing.

We guarantee the sheets of each box to be of uniform gauge and of the thickness indicated by the branding, within limits unimportant in handling or working.

We guarantee the sheets to be of the full dimensions marked on the boxes, uniform in size, and having square corners.

We guarantee the coating to be evenly distributed, and the sheets free from wire edges. It is better coated than any plate in the market, except the "old method" or double-dipped plates.

We guarantee that in the manufacture of "Camaret" palm oil is used as a flux in coating the sheets, resulting in a better quality of plate than it is possible to produce by the acid process, and that, owing to treatment with palm oil subsequent to coating, "Camaret" plates will remain free from rust longer, on exposure, than if coated with any other flux or finished by any other process.

Our prices are **Low**, considering the quality and coating of this plate, and it is thus placed within the reach of all requiring a **First-Class Plate** for roofing purposes.
We have in stock and purpose keeping up a **Full Assortment of I C 14x20 and I C 20x28, I X 14x20 and I X 20x28.**

GILBERTSON'S OLD METHOD.

Extra Coated.

The guaranty given to "Camaret" applies equally to "Gilbertson's Old Method," which is further guaranteed to carry **18 Pounds** of metal to the box of I C 14x20, and **36 Pounds** to the box of I C 20x28.

In view of the many new brands constantly coming into the market, many of which are of a very inferior quality, we have decided to **guarantee** the "Camaret" and "Gilbertson's Old Method," so that the trade at large may be able to rely on their always getting a plate that will meet their requirements, as the makers of these brands have **Agreed with Us** to keep up the standard of these plates in every respect.

We are also carrying in stock all well-known makers' brands of Roofing Plates, such as are kept by the trade generally, and which we are prepared to sell at lowest market prices.

MERCHANT & CO.,

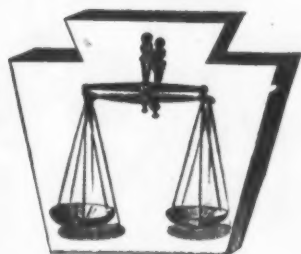
525 Arch St., Phila.

90 Beekman St., N. Y.

WILLIAM ALLEN & CO.,
BLANK BOOK MANUFACTURERS,
LITHOGRAPHERS, PRINTERS,
446 Broome Street, New York.
Send for Illustrated Descriptive Catalogue and Price List before ordering, and get our lowest N. Y. City prices.

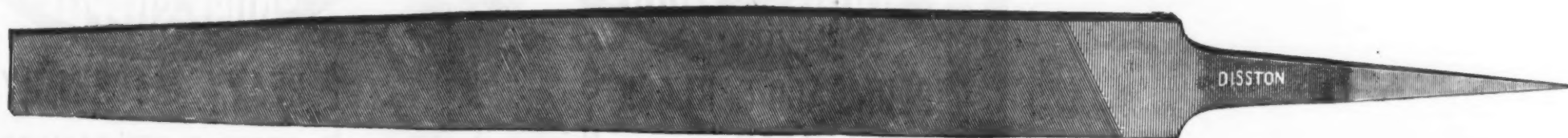


HENRY DISSTON & SONS,



KEYSTONE SAW, TOOL, STEEL AND FILE WORKS,

PHILADELPHIA, PA.



A GREAT IMPROVEMENT IN THE "MANUFACTURE OF FILES."

NEW PROCESS OF SHARPENING FILES AFTER HARDENING.

HAVING secured the right to sharpen Files by an improved process after they have been hardened, we would call attention to a few of its features:

The sharpening of file teeth after hardening is a valuable improvement in the manufacture of Files, and makes those so manufactured (under this process) as far superior to any made under the old system as a sharpened saw is to a dull one.

All cutting tools, except Files, are sharpened after having been hardened and tempered, and while it has been deemed essential that Files should be treated in the same manner, it has been impossible to sharpen the teeth until this recently-discovered method makes it practicable to do so, thus insuring a sharpness that has long been desired, and which cannot be otherwise obtained.

New mill Files sharpened by this process will not only do double the amount of work, but will make finer and sharper cutting edges, and will file a harder saw than the ordinary File. A trial of Files made under this improved process will fully prove their superiority, and can be relied on having a degree of excellence never before attained, and this without extra cost to the purchaser.

Rasps and Files for brass and other metals are specially benefited, and all packages containing such Rasps and Files will be labeled sharpened, and day and date when so done.

We use four hundred and fifty dozen Files weekly in our saw manufactories. This, together with the file-maker's test, makes a test undoubtedly correct.

We manufacture every kind of File known to the trade, and have just completed an illustrated File book, showing every shape manufactured, with full illustrated cuts of each. It is now ready for distribution, and will be furnished the trade on application.



The above cut represents our justly celebrated **No. 7 HAND SAW**, which, through the careful attention bestowed upon its manufacture by the late HENRY DISSTON, gained for him his world-wide reputation as a manufacturer of Saws which are made perfect in finish, quality of steel, and uniformity of hang and workmanship. So jealous are we of keeping up their high standard that their making is intrusted to none but our most experienced men through their entire course of manufacture, several of whom have worked upon DISSTON'S NO. 7 HAND SAWS for 35 years, thus insuring, through long experience and constant attention, that perfection which cannot be attained in a few years, nor by those who are constantly changing their workmen. These claims have been confirmed at the World's Great Exhibitions, medals having been awarded us in competition with the saw makers of all countries.

MORE NEWS OF THE Rocking Grate Bar.

PATENTED JANUARY, 1884.

Over Five Hundred Sets Already Under Steam Boilers
in the United States.

PRONOUNCED A "GRAND SUCCESS."

See what the Chicago, Rock Island and Pacific R.R. Co. are doing:
"We have had them in use some ten months, and are now putting them in all engines as fast as they come in. With your Grate we can run our engines the long run, 225 miles, without cleaning the fire, and when the engine gets through the fire is as clean as when starting out."

Himebaugh, Merriam & Co. say:

"We now use nothing but slack that costs about one-half as much as lump coal, and a carload of slack lasts us fully as long as a carload of coal, which makes the cost of running our boilers with your Grate only about one-half of what it is when run with other coal. They work very nicely, and fire easier than the old-style Grate."

The Chicago, Wilmington and Vermillion Coal Co. say:

"They are giving us as much steam from the poorest slack as we formerly got from the best nut coal."

Bloomington Pork Packing Co. say:

"We could not have got the necessary steam to run our business without them."

Six months in use. Bloomington, Ill.

The Mound City Distilling Co. say:

"We are burning no more of the lowest priced lump coal in the market than we were formerly obliged to use of the highest-priced—saving a good profit, 33 per cent. difference. We are pleased."

In use at their Distillery at St. Louis, Mo.

Mr. C. P. Buckingham, Pres. The Chicago Steel Works, says:

"A decided saving over the old grates. Used them seven months, and they have given satisfaction in every respect."

Shumway, Burgess & Co. say:

"Have increased our steam supply over 30 per cent., and relatively reduced our coal bill fully 20 per cent."

Ten months in use at their Bolt Works, Chicago.

Calumet Iron and Steel Co. say:

"Using no more slack to get the same amount of steam that we have been obtaining from lump coal from the old grates."

Five months in use at their Works, Chicago.

WRITE FOR PRICES AND PARTICULARS TO

THE ROCKING GRATE BAR CO.

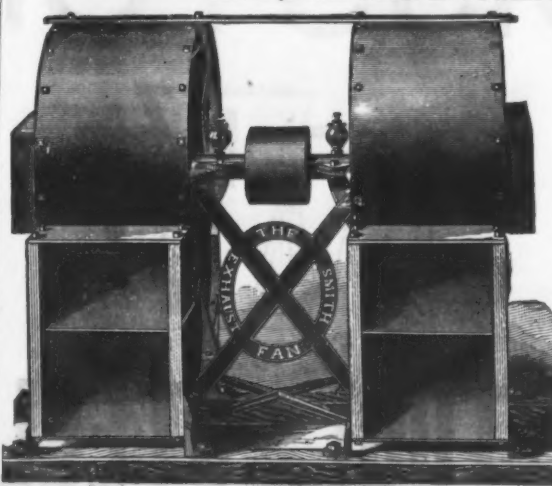
45 Franklin Street, Chicago, Ill.,

395 Canal Street, New York, and 702 S. Third St., St. Louis.

[SEE THIS ADVERTISEMENT NEXT WEEK.]

The Smith Patent Exhaust Fan, Forge and Pressure Blowers

SAVE 50 PER CENT. IN POWER APPLIED, AS COMPARED WITH OTHER MAKES.



DOUBLE EXHAUST FAN.

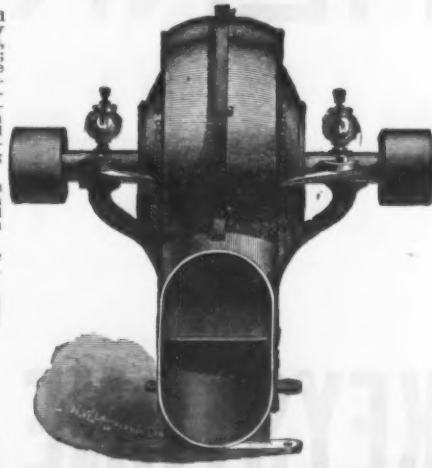
The Fans are specially adapted for removing dust from Emery and other Polishing Wheels, Grindstones and Cleaning Mills; Smoke and Gas from Machine Shops, Steam from Dyeing Establishments, Ventilating Buildings, Tunnels and Mines; removing Bark and Dust from Mills in Tanneries, Shavings and Dust from Planing Mill Machinery and other Wood-Working Establishments.

Cupola and Pressure Blowers are especially adapted to Cupola Furnaces and Forges, and all places where a strong Blast is required.

Every machine tested before shipping, and fully warranted.

**HUYETT & SMITH
MFG. CO.,**
No. 1400 Russell St.,
DETROIT, MICHIGAN.

Send for Catalogue and Prices.



CUPOLA AND FORGE BLOWER.

MANUFACTURERS OF AND
DEALERS IN ALL
KINDS OF

FOUNDRY FACINGS

**PLUMBAGO OR BLACK
LEAD**

For All Purposes.

Also Shippers of the Celebrated

CINCINNATI MOLDING SANDS

FOR STOVE PLATE, HEAVY AND LIGHT MACHINERY,
AGRICULTURAL AND BRASS WORK.

EAGLE

THE LARGEST FACING MILLS
IN THE WORLD.
Capacity, 650 Barrels
Per Day.

FOUNDRY SUPPLIES

**MILL
HEAVY MACHINERY
AND FINE
STOVE PLATE FACINGS**

A Specialty.

AGENTS FOR

Monk's Celebrated Molders' Tools.

S. Obermayer & Co., Props.,
CINCINNATI, OHIO, U. S. A.

★ N. Y. S. S. P. Co. ★

E. T. COPELAND, General Agent, 30 Cortlandt St., New York City,
BUILDERS OF

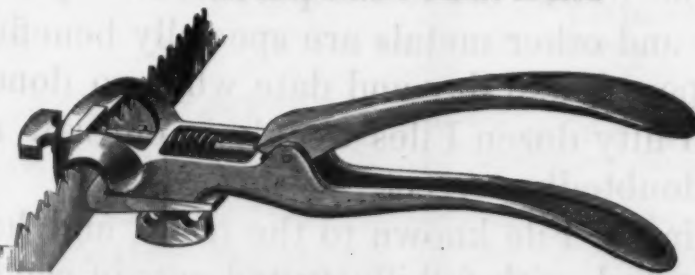
STEAM ENGINES AND BOILERS.

The productions of the *New York Safety Steam Power Co.* have been in the market for fifteen years, and are widely used and highly esteemed wherever known.

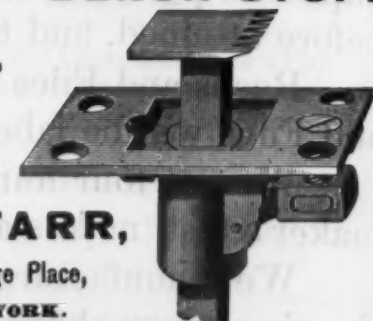
2500 ENGINES, - - 50,000 HORSE-POWER.

MORRILL'S PERFECT SAW SETS AND BENCH STOP.

FOR SETTING EVERY VARIETY OF SAWS.



For price lists
and discounts
Address



ASA FARR,
64 College Place,
NEW YORK.

JEFFERSON NAILS

JEFFERSON PIG IRON.

Forge and Foundry, JEFFERSON IRON WORKS.
Office and Works, - - - - - STEUBENVILLE, OHIO.

W. H. WALLACE, President.

C. B. DOTY, Vice-President.

GEO. P. HARDEN, Secretary.

UNION FOUNDRY AND PULLMAN CAR WHEEL WORKS,

N. S. BOUTON, President.

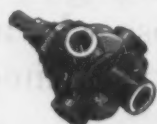
CORRESPONDENCE SOLICITED AND ESTIMATES MADE ON
HEAVY MACHINERY, AND ALL SIZES OF FLY WHEELS, PULLEYS, &c.

Special Machinery for Grain Elevators, Grain Steam Shovels, &c., contracted for. Car Wheels and Car Castings at lowest rates.

Office, First National Bank Building, CHICAGO.

GLENN'S VALVE MANUFACTORY,

PATENT BALANCED
HYDRAULIC AND
STEAM VALVES.



J. S. GLENN, Proprietor.
OFFICE:
115 Fremont Street,
CHICAGO.



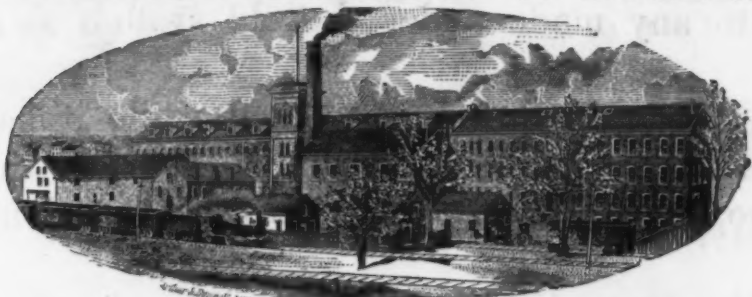
WM. ESTERBROOK,
Wholesale Manufacturer of
Coal Hods

311 Cherry St., PHILADELPHIA.



(Raised Letter Tool.)
THOMAS J. ANDRESS,
Manufacturer of Glass Cutters
831 Cherry Street, PHILADELPHIA, PA.
Every Andress Tool Warranted.

THE STANLEY WORKS



MANUFACTURERS OF

Wrought Iron

BUTTS, HINGES

AND
DOOR

BOLTS



FACTORIES:

New Britain,
Connecticut.

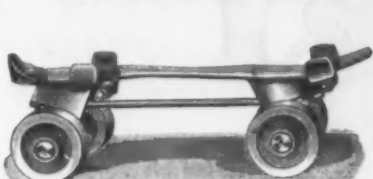
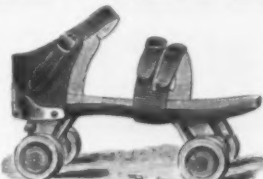
WAREHOUSE:

79 Chambers Street, New York.

Goods furnished Plain, Galvanized, Japanned, Bronzed & Nickel Plated.

THE "NANTASKET" ROLLER SKATE.

STRONGEST.



EASIEST.

Rink, Clamp, Half-Clamp and Sidewalk Skates.

OUR CLAMP SKATES DEFY COMPARISON. THESE SKATES ARE IN USE
THROUGHOUT UNITED STATES AND CANADA.

There are but two secrets of our success: 1st. We make absolutely the best Skate. 2d. We uphold the dignity of dealers. We are very particular in referring inquiries to our agents within their respective territories.

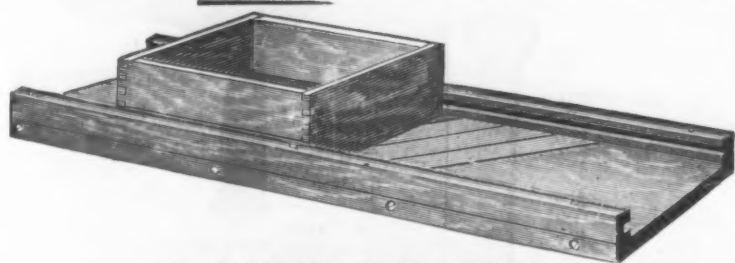
FOR CATALOGUES, ADDRESS

The NANTASKET ROLLER SKATE CO., 82 Merrimack St., Lowell, Mass.

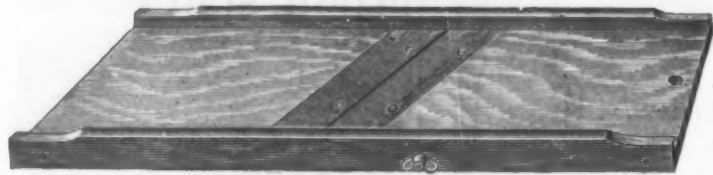
THE BEST GLUE IN
THE WORLD FOR
Pattern Making,
EMERY BELTS,
WHEELS, &c., &c.
Send for Pamphlet.

**LE PAGES
LIQUID GLUE**
IN BOTTLES AND IN CANS. READY FOR USE.
STRONGER, MORE CONVENIENT AND
MORE ECONOMICAL THAN ANY OTHER GLUE
SOLD EVERYWHERE ON ITS MERITS BY
RUSSIA CEMENT CO. GLOUCESTER, MASS.

AWARDED THE
GOLD MEDAL
AT THE
INTERNATIONAL
EXHIBITION,
London, 1883.



No. 3, 3 Knives, 7 x 24. Per Doz. \$



No. 2, 2 Knives. Per Doz. \$



No. 1, 1 Knife. Per Doz. \$

KRAUT AND SLAW CUTTERS.

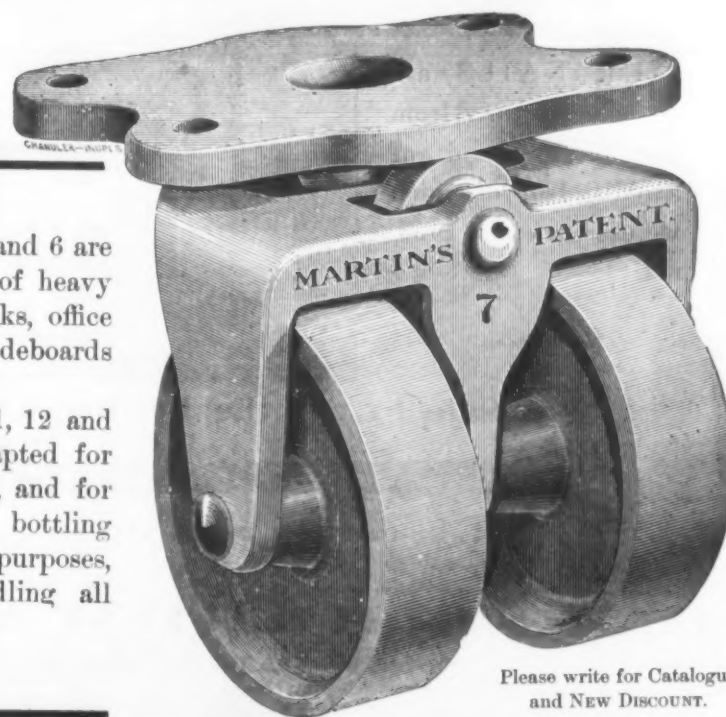
Our Kraut and Slaw Cutters are made from well-seasoned cherry, and fully guaranteed to be first-class goods in every respect.

Tucker's Alarm Tills,
STOVE TRUCKS,
KRAUT AND SLAW CUTTERS,
Wood Saw Frames,
HOOSIER FOLDING SAW BUCKS,
Bench Hooks,
Towel Rollers.

Write for Price List and Discount.

PHOENIX CASTER CO., Indianapolis, Ind.

MANUFACTURERS OF
MARTIN'S PATENT CASTER.



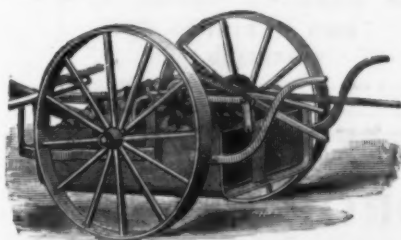
Please write for Catalogue and New Discount.

Our Nos. 2, 3, 4, 5 and 6 are adapted for all kinds of heavy furniture, writing desks, office chairs, refrigerators, sideboards and book-cases.

Our Nos. 7, 8, 10, 11, 12 and 14 are especially adapted for all kinds of TRUCKS, and for fruit canning, beer bottling tables, and for factory purposes, for moving and handling all kinds of work.

NASHUA LOCK COMPANY, NASHUA N. H.

H. H. HARVEY, Augusta, Me.,
Manufacturer of RAILROAD, MINERS', BLACKSMITHS', STONE AND MARBLE CUTTERS', GRIST MILL AND BOILER MAKERS' HAMMERS AND TOOLS
CATALOGUE ON APPLICATION. SEE ILLUSTRATED ADVERTISEMENT IN THE FIRST ISSUE OF EACH MONTH. ESTABLISHED IN 1866.



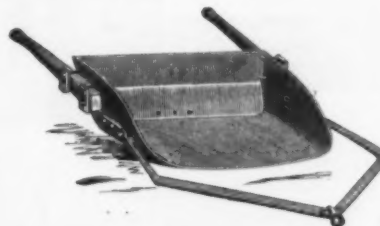
HASLUP'S PAT. WHEELED SCRAPER

Has great advantages over all others. It has More Capacity and is Easier Handled by Man and Team. Good on long or short hauls. Three sizes: 9, 13 and 16 cubic feet.

HASLUP'S ALL-STEEL DRAG SCRAPERS

Beat all others for capacity, durability, strength, light draft. Being ALL STEEL (except wood handles), are lighter, stronger and better made than any other. 3 sizes. Also, Township and Railroad Plows.

SIDNEY STEEL SCRAPER CO., Sidney, Ohio.



THE SIMPSON VISE. PRICES REDUCED.



Swivel Coach-Maker's Vise, WITH SWIVEL JAW.

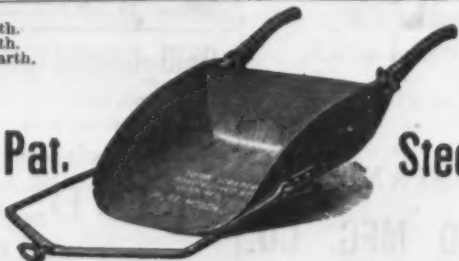
The best Vise ever made for woodworkers' use. For Illustrated Catalogue and Discounts write to

ATHOL MACHINE CO.,
Manufacturers, Athol, Mass.

No. 1 Carries 7 feet earth.
No. 2 Carries 5 feet earth.
No. 3 Carries 3 1/2 feet earth.

PATENTED
December 27th, 1881.
Runners Patented
February 11th, 1884.

The York Pat. Steel Scraper



The Lightest and Strongest Scraper made. The body is made of one single piece of steel. The handles are fastened inside of fold, and free from all obstructions. The body, ball and runners are all made of steel. Especially suited for contractors. Send for circulars. Manufactured by

THE YORK MFG. CO., Limited, Portsmouth, Ohio.

PREPARED BY BILLINGS, TAYLOR & CO.,
CLEVELAND, OHIO,

HOUSE PAINTS Color Makers, Varnish Makers, AND PAINT MANUFACTURERS.

Send for Sample Card and Catalogue.

READY FOR USE. Eastern Office, 105 John St., New York City.

J. M. SCHOONMAKER.

MANUFACTURER AND SHIPPER OF

CONNELLSVILLE COKE

Capacity of Mines, 2500 Tons Daily.

Siding connections with all lines of Railroads.

Office, 120 Water Street, PITTSBURGH, PA.



LE PACE'S PATENT RUBBER POCKET PISTOL CASE

Protects the Pistol from Perspiration. Prevents its Wearing the Pocket. Permits Instant Withdrawal.

Flexible and Easy in the Pocket

TOWER & LYON, Manufacturers,

96 CHAMBERS ST., NEW YORK.

New Patent Self-Acting Hasp Lock.

PATENTED JANUARY 22, 1884.

Hasp, Staple and Lock in one piece. Both ends absolutely secure. Suitable for Barns, Granaries, Warehouses, Cars, Wood or Iron Chests and Lockers of every description. It is the **Best Lock**. Sample Lock, with Catalogue, sent, postpaid, for 50 cents.

STODDARD LOCK & MFG. CO.,
104 READE STREET, NEW YORK.



THE NEW GIANT DRILL CHUCK.

Holds a Drill With the Grip of a Giant. All Steel.

Parts Interchangeable
SIMPLE IN CONSTRUCTION.

EASY TO TAKE APART AND CLEAN. BEST OF WORKMANSHIP AND VERY CHEAP. Manufactured and sold by

THE SMITH & EGGE MFG. CO. Bridgeport, Ct.

PIG IRON,

BAR IRON,

BAR STEEL,

STEEL BLOOMS,

STEEL BILLETS.

RIVERSIDE IRON WORKS,

MFRS. OF

RIVERSIDE STEEL NAILS

WHEELING, W. VA.

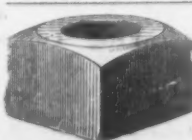
SMALL T RAILS,

FLAT RAILS

OF IRON OR STEEL,

FISH BARS

OF IRON OR STEEL.



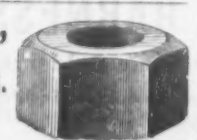
NEW HAVEN NUT CO.,

MANUFACTURERS OF

HOT-PRESSED NUTS AND WASHERS.

See Iron Age First Issue Each Month

WESTVILLE, CONN.



R. T. Pettebone. Patent Scoops.

SPECIALLY ADAPTED FOR

LOCOMOTIVE, MINERS' and FURNACE USE.

MADE OF BEST MATERIALS AND FULLY WARRANTED.

PAYNE PETTEBONE & SON,
WYOMING, PA.

Scoop bowl pressed from one solid piece of Cast Steel. Solid Front-strap.



FRONT VIEW

F. K. BOWES,

WESTERN AGENT,

Salesroom, 31 Dearborn St., Chicago, Ill.



Gendron Iron Wheel Co.

TOLEDO, OHIO,

Manufacturers of

IRON AND STEEL WHEELS.

All sizes and descriptions of Iron and Steel Wheels for Hay Rakes, Cultivators, Wheelbarrows, &c.

Also Steel Wheels with Rubber Tires for Children's Carriages, Velocipedes, Bicycles, &c. Write for Prices.

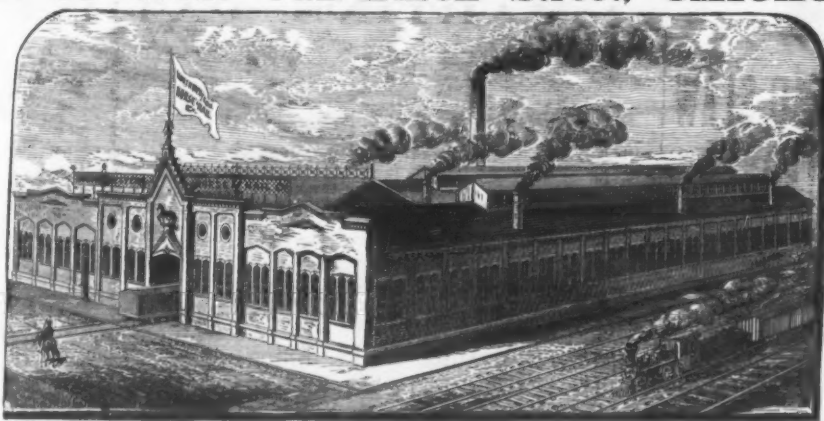
NORTHWESTERN HORSE NAIL CO.,

No. 68 West Van Buren Street, CHICAGO.

Regular Head.



OUR NAILS are manufactured from the finest brand of Swedish Iron, of which we use the entire product.



IN QUALITY, uniformity of shape and style, they are unequalled.

They are the safest nail to drive.

City Head.



For Sale by All the Leading Houses Throughout the United States.



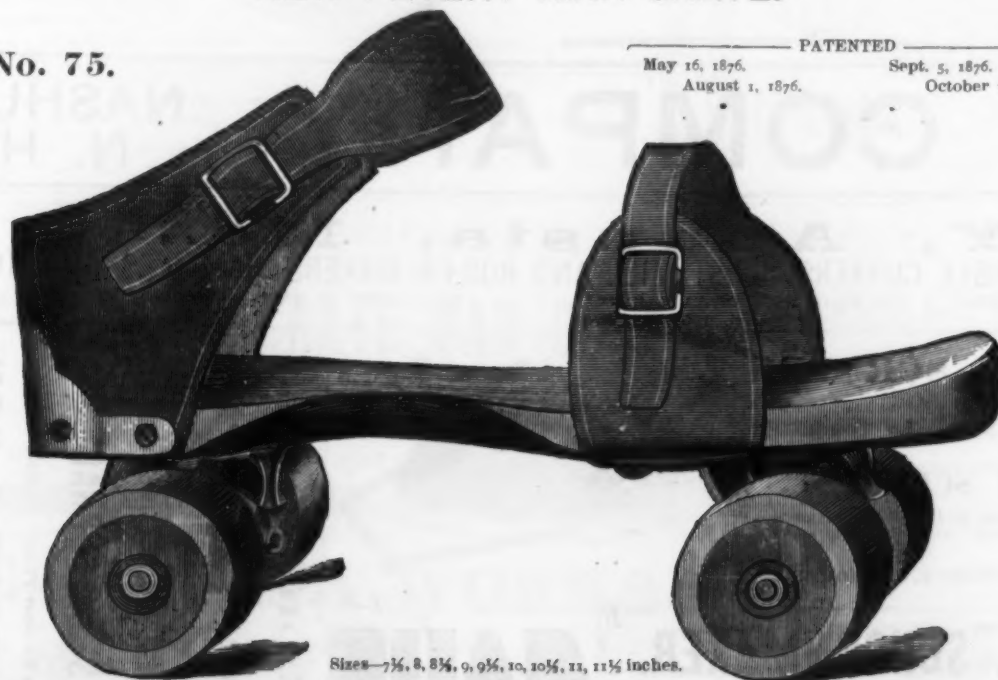
COLD TEST OF IRON USED EXCLUSIVELY BY NORTHWESTERN HORSE NAIL CO.

A. W. KINGSLAND, Secretary.

UNION HARDWARE CO.'S

NEW PATENT RINK SKATE.

No. 75.



Sizes—7½, 8, 8½, 9, 9½, 10, 10½, 11, 11½ inches.

We have just issued three Catalogues of our goods, any of which will be mailed upon application—one Catalogue illustrating six styles of Roller Skates; another illustrating thirty different styles IceSkates; also a Catalogue giving illustrations of a full line of Gun Implements, Wood Goods, Dog Collars, Curry Combs, &c.

UNION HARDWARE COMPANY, 75 Chambers Street, NEW YORK. Manufacturing, TORRINGTON, CONN.

The Indestructible Cast-Iron Furnace Lamp.

NO SOLDER.

THE BEST AND CHEAPEST.

Superseding all Others Wherever Introduced.

TWO SIZES: { No. 1, holding 2 Pints.
No. 2, " " 2 " }



TAYLOR & BOGGIS F.D.Y. CO.
CLEVELAND, OHIO.

Sample sent you if desired.



TRADE MARK.



COVERT'S PATENT HARNESS SNAPS,

Chain and Rope Goods, Adjustable Soldering Irons, &c.

These Goods are sold by all Leading Jobbers in General and Saddlery Hardware at Manufacturers' Prices. Send for Illustrated Catalogue and Price List.

COVERT MANFG. CO., West Troy, N. Y.

ILLINOIS IRON & BOLT CO.,

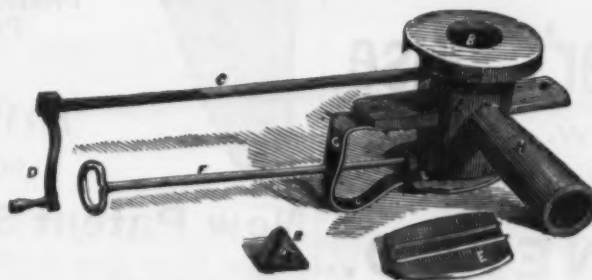
Nos. 20 to 26 Main Street,

CARPENTERSVILLE, KANE CO., ILL.

MANUFACTURERS OF

NORTON'S PAT. TUYERE,

Blacksmiths' Tools,



Thimble Skins,

BLACKSMITHS' DRILLS,

Jack Screws, Tire Benders, Track Jacks,
Carriage Makers' Vises,

SAD IRONS, COPYING PRESSES AND STANDS, &c.



FOLLETT LANTERN AND MFG. CO.

169 Water St.,
ROCHESTER, N. Y. 1884.

TIPPING TUBULAR LANTERN

Patented 1882, 1883 and 1884.
Acknowledged by Experts and every one the Most Complete Lantern on the Market. Finished equal to a Conductor's Lantern.
ALSO MANUFACTURERS OF
Speaking Tubes, Conductor Elbows and Stove-Pipe Elbows.

SEND FOR PRICE LIST.

A. J. BIXBY, Pres. R. M. UPTON, Treas. C. S. UPTON, Sec. and Mangr.
General Sales Agents: Sidney Shepard & Co., Buffalo, N. Y.; Abrams, French & Co., Boston, Mass.; Kennedy, Spaulding & Co., Syracuse, N. Y.

PERFECTION WINDOW CLEANER.



SIMPLE,
USEFUL
AND
DURABLE.

STAPLE
AS
MOPS
OR
BROOMS.

Beware of Infringements.

FLOOR SCRUBBERS.



Perfection Window Cleaner Co.,

205 KINZIE STREET,

CHICAGO, ILLINOIS, U. S. A.

THE CELEBRATED DANGLER TORCH



For Oil or Gasoline. Hanging or Portable. Without Wick or Chimney. So constructed to convert the Oil or Gasoline into a Gas and to throw out 14 Jets, 5 inches in length, and gives a light equal to 8 Gas Jets. The light is economical and especially adapted for Rolling Mills, Foundries, Machine and Car Shops, Round Houses, Street Venders, &c.
Price for Hanging or Wall Torch, \$2, and for the Portable, \$3. Special prices to the trade on application.

ADDRESS

THE DANGLER VAPOR STOVE AND REFINING CO.,

CLEVELAND, OHIO,

and No. 311 State Street, CHICAGO, ILL.

BEECHER & PECK,

MANUFACTURERS OF

DROP PRESSES,

DROP FORGINGS, &c.,

NEW HAVEN, CONN.

Grindstones, Emery, &c.

Walter R. Wood
GRINDSTONES.

Berea, O., Nova Scotia, & other brands.
283 and 285 Front Street, New York.

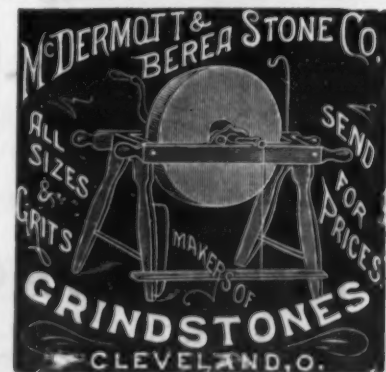
GEO. CHASE,

The largest manufacturers in the world of

OIL STONE

Of all description.

107th Street and Harlem River,
Send for Illustrated Price List. NEW YORK.



OHIO GRINDSTONE COMPANY.

H. H. CLOUGH, Pres. L. P. HALDEMAN,
J. M. WORTHINGTON, V. Pl. Secy and Treas.

MANUFACTURERS OF

GRINDSTONES

OF ALL KINDS.

127 SUPERIOR ST.

CLEVELAND, OHIO.

WORTHINGTON & SONS

MANUFACTURERS OF

GRINDSTONES,

ALSO

SCYTHE STONES

OF ALL SHAPES.

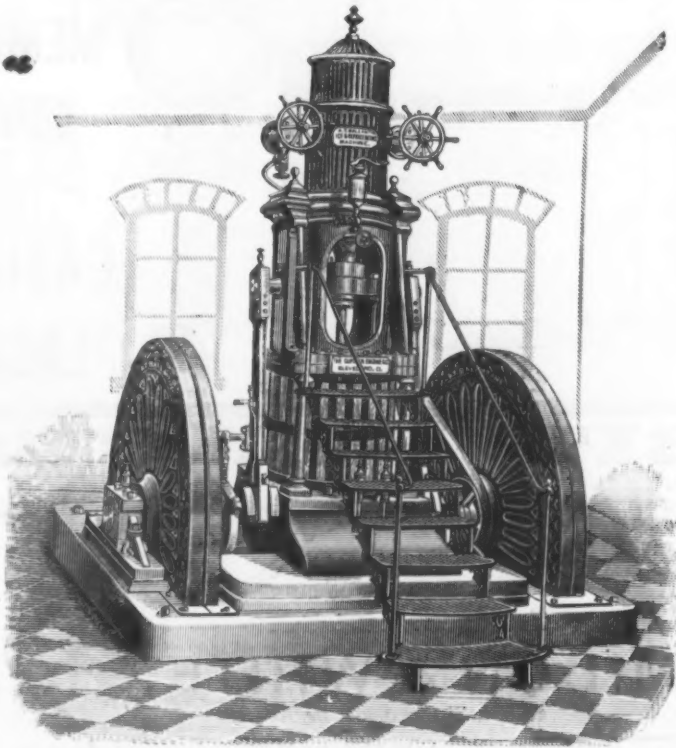
BEST GRIT KNOWN.

Finest Put Up Goods in the Market.

Cor. Front and River Sts., CLEVELAND, OHIO.

The Ballantine Refrigerating Plant.

Recent developments in artificial ice and refrigerating machinery have added a good deal to its popularity, and refrigerating plants are now extensively used in various branches of industry, both here and abroad.



The Ballantine Refrigerating Plant.—Fig. 1.—General View.

In view of this the engravings on this and the following pages, representing the A. T. Ballantine ice machine and refrigerating plant, turned out by the Cummer Engine Company, of Cleveland, Ohio, will undoubtedly prove of interest

sists of about 20 separate spiral coils, 150 feet each, and placed about 4 inches apart. With the combined arrangement of a water sprinkler, I, and the draft of air, the sensible heat is taken from the hot gas, and under the pressure contained in the condenser, the gas is liquefied again and passed

one not well versed in dynamics to understand what is really meant. The terms *force*, *power* and *work* represent three distinct physical quantities which cannot be converted into one another, and should, therefore, not be used one for the other.

Power is the product of force and velocity, of which there are two units in use, namely, *effect* and *horse-power*.

The metric unit, *effect*, is a force of 1 kilogram moving with a velocity of 1 meter per second, which expression could be contracted to *p*; that is, *p* should stand for power, or *puissance* in effects.

The other unit, or *horse-power*, is 75 effects, or 75 *p*, which unit I should prefer to be contracted to that of *h*.

Work is the product of force, velocity and time, but, as the product of velocity and

Hydraulic Power Distribution in Cities.

English papers are again devoting space to the subject of hydraulic-power distribution in cities, and supply interesting particulars concerning the growth and success attending the operation of what is known as the London Hydraulic Power Company. The system, as some of our readers undoubtedly remember, was first tried in Hull several years ago, and the success of the venture naturally directed attention to the field open in London, and in 1882 a company was formed, which obtained power within a certain limited area, to supply the city warehouses with the power which had been found so useful in railroad stations and other places. Further grants have recently been

8 miles, are 6-inch cast-iron pipes. They are in 9 foot lengths, and are tested to 2500 pounds per square inch at the works. The joints are turned and bored spigots and sockets, and are made tight with gutta-percha rings held in place by two 1/4-inch bolts passing through lugs on each pipe. As each section is laid the water is admitted to test the joint. Stop-valves are inserted every 400 or 500 yards, and the position of a leak can be located within that distance. We understand that since the beginning of this year the quantity of water delivered has increased 40 per cent.

Proposed Canal Through Ireland.—One of our English contemporaries informs us that the proposal to construct a ship canal

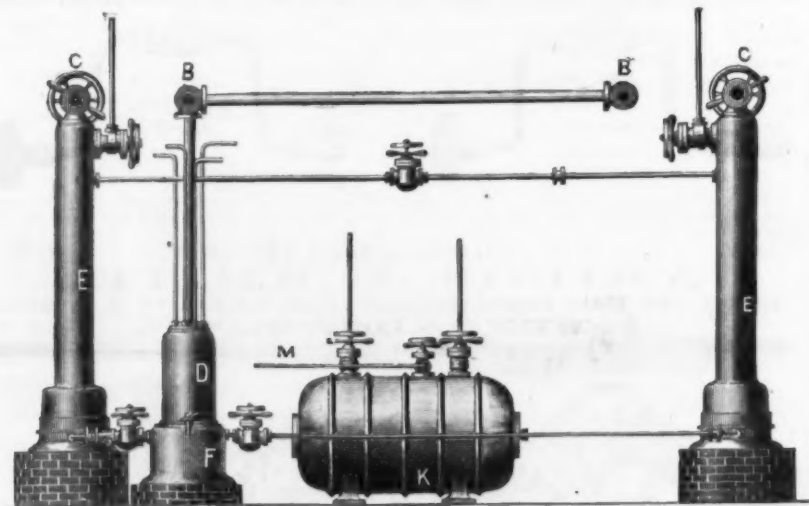


Fig. 2.—Elevation of Ammonia Tank, Oil-Drip, &c.

to some of our readers, giving, as they do, a general idea of the construction and arrangement and method of operation of a plant which, in the course of practical work, has been found to give eminently satisfactory results.

Fig. 1 is a perspective view, while Figs. 3 and 4 are side elevation and plan respectively.

part of the plant, a purifier, F, out of which at any time, without stopping the machine, water, oil or other refuse, which always largely impair the efficiency of the cooling surfaces, can be removed.

The oil-drips are also connected with each other, so that where two or more engines and condensers are used any one engine can be worked with both or any one condenser, so in case of accident no delay in the working of the plant need occur.

Metric Nomenclature.

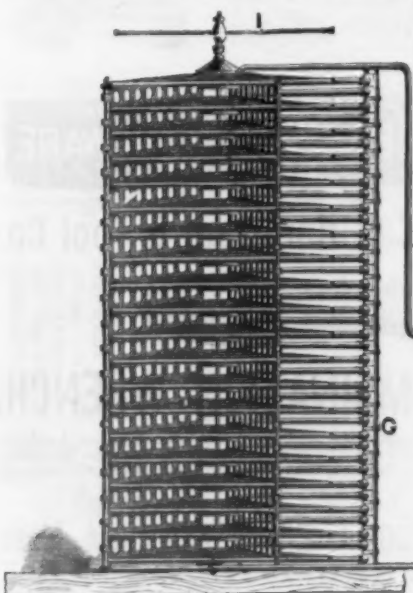
The contractions of the metric nomenclature adopted by the International Metrical Congress, at Paris, and published in the August number of *Mechanics*, have, most of them, been in use for many years, and will, no doubt, be generally adopted by all nations using the metric system. The said Congress,

time is linear space, work can also be expressed by force and space. One metric unit of work is a force of 1 kilogram working through a space of 1 meter, which expression could be contracted to *k*. Another unit of work is a force of 1 ton, moving, or working, through a space of 1 meter, which unit is used in dynamics of heavy ordnance and other heavy work, which could be contracted to capital K.

obtained and the district supplied by the company has experienced considerable extension. With present pumping capacity the company are enabled to take as much as 1,000,000 gallons of water from the Thames every day, which is considerably beyond their requirements just now, representing from 2000 to 3000 horse-power. The water as raised from the river is necessarily very muddy, and is consequently passed first into settling tanks and subsequently through sponge filters until it is practically clear. It is then stored in the working tanks. The pumps deliver into two accumulators 20 inches in diameter and 23-foot lift, loaded to give a pressure of 700 pounds to the square inch in the mains. There are two sets of pumping engines, each capable of indicating

across Ireland is again to the fore. The Dublin *Freeman's Journal* has published particulars of the project for constructing a ship canal across Ireland, which it assures its readers is a reality and has been warmly espoused by influential people in England. "Elaborate plans and surveys have been made at considerable expense, and have been submitted by Captain Eads, the American engineer. The proposed canal would be 127 miles in length, and would contain 30 locks. For ships of 1500 tons the cost would be £8,000,000; for ships of 2500 tons, £12,000,000, and for ships of 5000 tons and upward £20,000,000. If built on this scale the canal would be 200 feet wide on the surface and 100 feet at the bottom. The passage through the canal would be effected by a system of towage, and it is estimated that the passage of a ship from Galway Bay to Kingstown would occupy between 24 and 36 hours. An alternative scheme of a ship railway, on which the ships would be carried in cradles, which could be constructed for £10,000,000, is proposed, by which the duration of the passage through the island would be reduced to 12 hours. An immense aqueduct would have to be constructed to carry the canal over the Shannon at Banogue. It would be over 3 miles in length, and would be one of the most difficult and costly works in connection with the undertaking."

The statistician of the Department of Agriculture, Mr. J. R. Dodge, has in preparation a publication on the industrial economy of the United States, in which, along with a mass of other interesting information, the phenomenal progress of the Central "West" is presented in deductions from statistics, showing that half the cultivated area of the United States lies in one-fourth its territory, producing more than three-fourths of some of the principal crops. The fact is shown that the Ohio Valley is the most fully occupied body of land, Ohio having 94 per cent. of her surface in farms; Indiana, 88.9; Illinois, 83.4; Kentucky 84, and no other State as much. It is shown that already three-tenths of the manufactures of the United States are produced within the Central "West" in less than three-tenths the area of the country within half a century from its settlement.



ively, and Fig. 2 is a front view of the ammonia receiver, oil-drip, &c. From the receiver K, Fig. 4, which contains the necessary liquid anhydrous ammonia, through pipe M and feed-cocks N, the liquid is passed through heavy small pipes in exactly desired quantities into the end of the freezing coils in the different rooms, cellars, brine-vats, water and ammonia coolers to be cooled, and the other end of these different coils is directly connected with the collector D. The expanded ammonia gas, which has a pressure only of from 5 to 20 pounds per square inch, is drawn through suction-cock B into the compressor A (Fig. 3), the lower part of which is a steam cylinder, and the upper part a gas compressor, having on one side the suction-cock B, which draws the gas into the cylinder and compresses it from 125 to 150 pounds per square inch. The compressed hot gas is then passed through pressure-cock U to the oil-drip E, where, by a simple and ingenious arrangement, all impurities as well as oil, are separated, and the pure, hot gas is passed through pipe H under the same pressure through condenser G, which con-

however, has omitted to establish contractions and distinctions of dynamical terms which are much needed. In Count Th. Du Moncel's work on "Electricity as a Motive Power," the terms *force*, *power* and *work* are promiscuously used one for the other throughout the work, so that it is impossible for any

There is one expression in Count Du Moncel's work which sounds awkward, namely, "transport of force," which expression should be "transmission of power." Material substances are transported, but physical quantities are transmitted.—John W. Nystrom, in *Mechanics* for September.

about 160 horse-power. The engine-house is designed to accommodate six such sets when the system is fully developed. From the pumping station a network of mains extends to the different points to be supplied. These mains, which at present measure in the aggregate 7 or

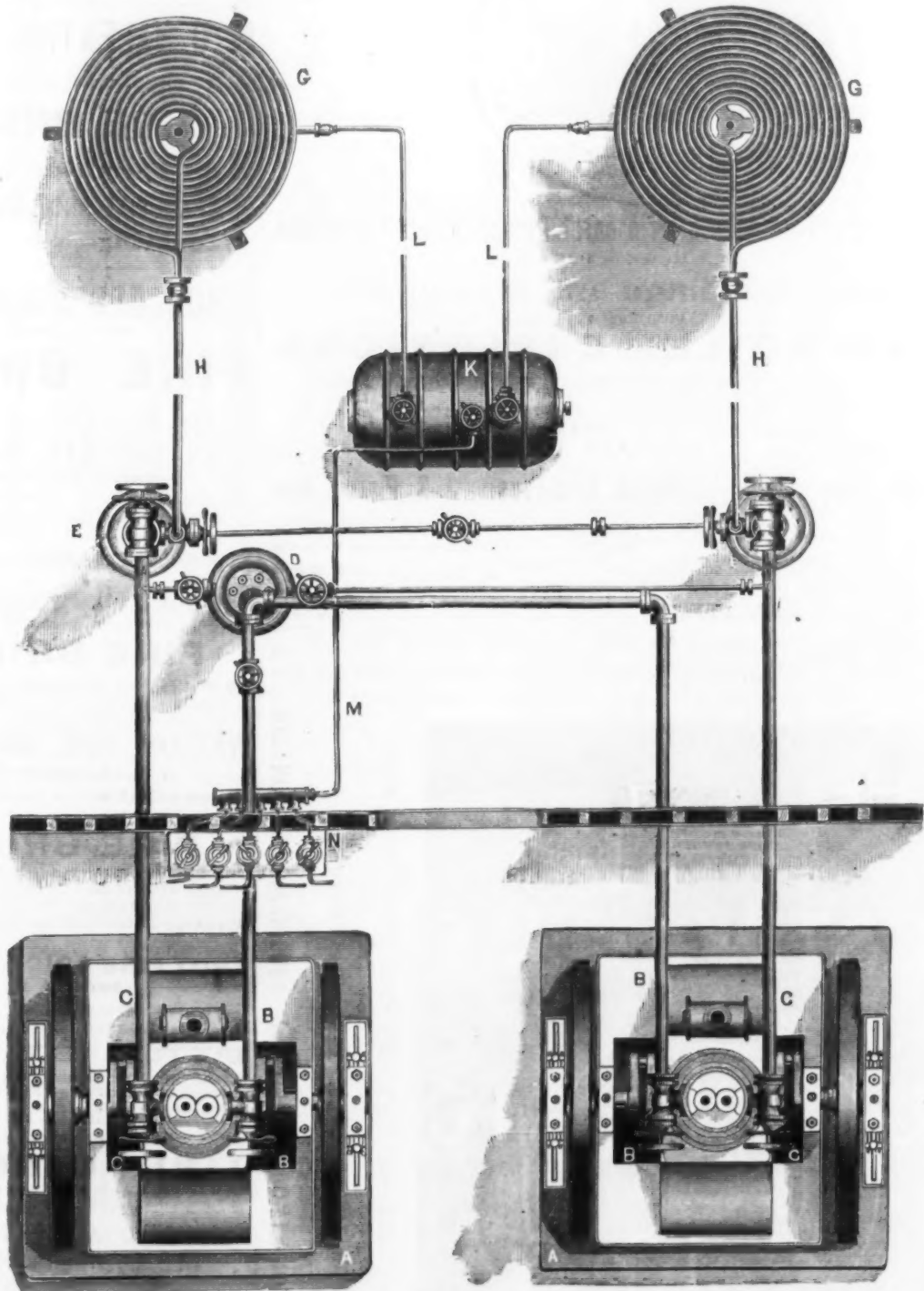


Fig. 4.—Plan.

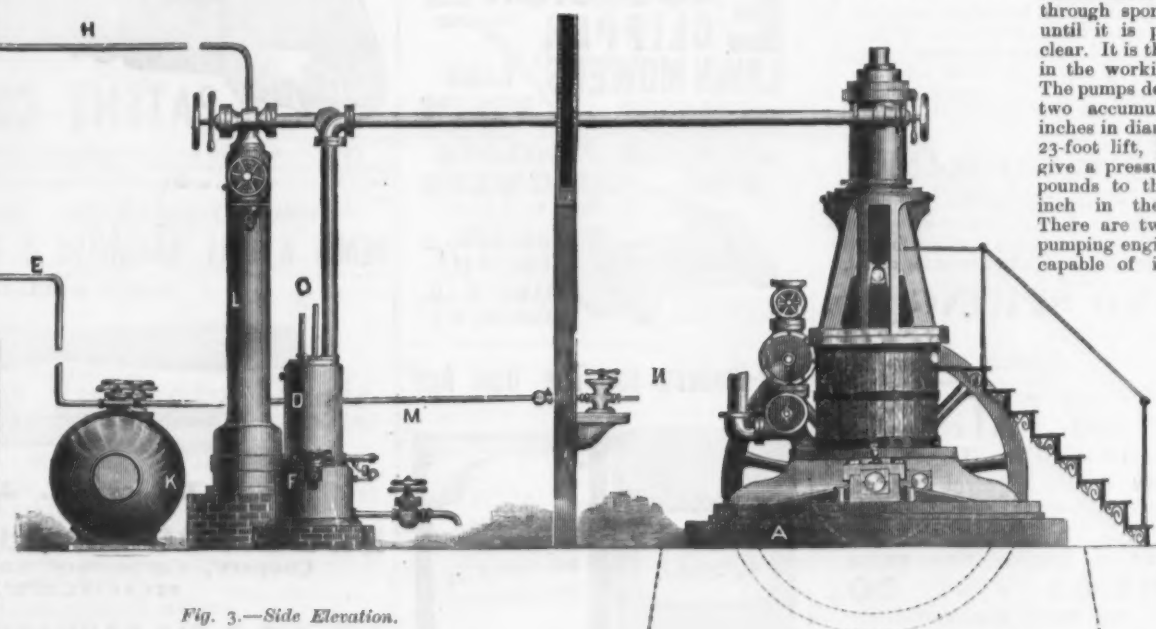
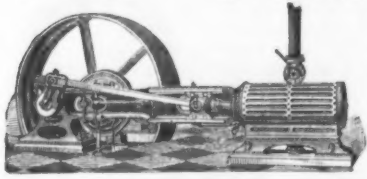


Fig. 3.—Side Elevation.

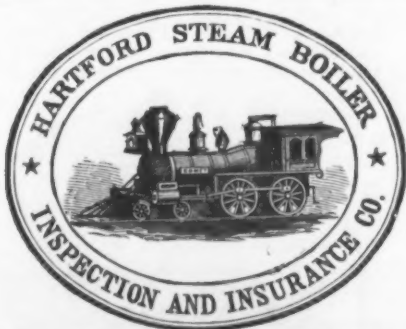
THE CUMMER ENGINE



Awarded Gold Medals and All Highest Premiums for BEST AUTOMATIC ENGINE at both Cincinnati and Louisville in 1883.

Send for 150-Page Illustrated Catalogue.

THE CUMMER ENGINE CO., Cleveland, Ohio.



Issues Policies of Insurance after a careful inspection of the Boilers,

COVERING ALL LOSS OR DAMAGE TO

Boilers, Buildings and Machinery,

ARISING FROM

STEAM BOILER EXPLOSIONS.

The Business of the Company includes all kinds of Steam Boilers.

Full information concerning the plan of the Company's operations can be obtained at the

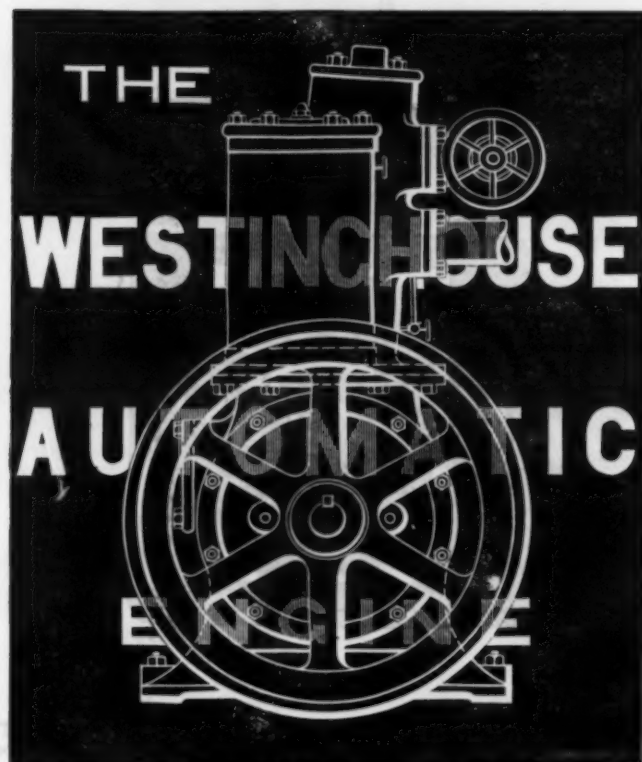
COMPANY'S OFFICE, HARTFORD, CONN., or at any agency.

J. M. ALLEN, Pres. W. B. FRANKLIN, Vice-Pres. J. B. Pierce, Sec.

Board of Directors.

J. M. ALLEN, President.
LUCIUS J. HENDEE, President Aetna Fire Ins. Co.
FRANK W. CHENEY, of Cheney Bros. Silk Mfrs., Hartford and New York.
CHARLES M. BEACH, of Beach & Company.
DANIEL PHILLIPS, of Adams' Express Company.
GEO. M. HARTHOLMEW, President Holyoke Water Power Company.
RICHARD W. H. JARVIS, President Colt's Pat. Fire Arms Manufacturing Co.
THOMAS O. ENDERS, of the Aetna Life Insurance Co.
LEVERETT BRAINARD, of the Case, Lockwood & Brainard Co.

GEN. WM. B. FRANKLIN, Vice-President Colt's Pat. Fire Arms Mfg. Co.
GEO. CROMPTON, Crompton Loom Works Worcester, Mass.
HON. THOMAS TALBOT, Ex-Governor of Massachusetts, Lowell.
NEWTON CASE, of the Case, Lockwood & Brainard Co.
WM. B. SLATER, Cotton Manufacturer, Providence.
NELSON HOLLISTER, of the State Bank, Hartford.
CHAS. T. PARRY, of Baldwin Locomotive Works, Philadelphia.
HON. HENRY C. ROBINSON, Attorney at Law, Hartford.



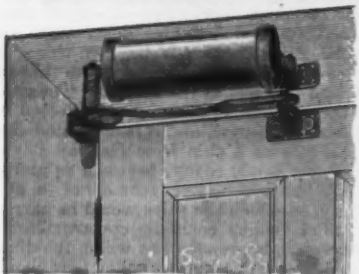
SEND FOR ILLUSTRATED CIRCULAR AND REFERENCE LIST.

900 ENGINES NOW IN USE! 24,000 HORSE-POWER NOW RUNNING!
Sales, 2000 H.-P. Per Month.

THE WESTINGHOUSE MACHINE COMPANY, PITTSBURGH, PA.

SALE-ROOM: 51 Liberty Street, New York; 401 College Street, Charlotte, N.C.; 401 Elm Street, Dallas, Texas; 33 South Market Street, Nashville, Tenn.; Fairbanks, Morse & Co., Chicago, Cleveland, Cincinnati, Louisville and St. Paul; Fairbanks & Co., St. Louis, Indianapolis and Denver.

THE SHAW DOOR CHECK AND SPRING



was the first to cover the important principle of swinging a door to within a few inches of closing, and then surely and without slamming complete the operation. Moreover, the vital principle of all air checks is covered by its patents, and it is the only one that can be safely bought by dealer or consumer.

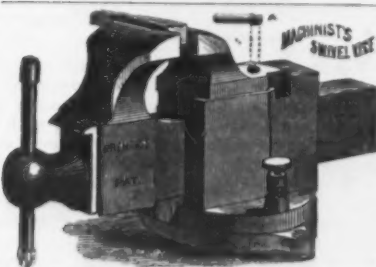
PRESERVE YOUR SCREEN DOORS.

This Company manufacture the only Screen Door Spring in the market that employs compressed air to stop the slamming, at the low price of \$2.50. Discount to the trade. Send for circular.

SHAW DOOR CHECK AND SPRING CO.

MANUFACTURERS AND SOLE AGENTS,

164 High Street, Boston, Mass.



PRENTISS' PAT. VISES,

Adjustable Jaw.

Stationary or Pat. Swivel Bottoms.

ADAPTED TO ALL KINDS OF VISE WORK. ALSO

"PEERLESS" SWIVEL PIPE GRIP,

FITS ANY VISE. SOLD BY THE TRADE.

PRENTISS VISE CO.,

93 Day Street, New York.

SOLE PROPRIETORS. SEND FOR CIRCULAR.

THE GLAMORGAN CO.,

Founders and Machinists, LYNCHBURG, VA., Manufacturers of

Heavy and Light Machinery,

Iron and Brass Castings, Engines, Boilers, Flouring, Saw and Sumac Mill Machinery. Special and prompt attention given to Blast Furnace, Mining and Tobacco Machinery, Hydraulic Tobacco Presses, Box Screw Presses, Hoghead Press: crews, Hydraulic, Steam and Hand Pumps, Steam Locomotive Kettles, Hydraulic Cocks and Connections, Steam Fittings and Fixtures of all kinds for Tobacco Factories.

B. KREISCHER & SONS, FIRE BRICK.

BEST AND CHEAPEST.

Established 1845.

Office, foot of Houston Street, East River, NEW YORK.

NEWTON & CO., ALBANY, N. Y.,

MANUFACTURERS OF BEST QUALITY

FIRE BRICK

AND

STOVE LININGS.

M. D. VALENTINE & BRO.,

MANUFACTURERS OF

FIRE BRICK

And Furnace Blocks,

DRAIN PIPE AND LAND TILE,

Woodbridge, - - N. J.

BORGNER & O'BRIEN,

MANUFACTURERS

FIRE BRICK

AND

Edge Pressed Furnace Blocks,

CLAY RETORTS, TILES, &c.,

Twenty-third Street,

Above Race, PHILADELPHIA.

Twenty years' practical Experience.

WOODBRIDGE CLAY MINING & REFIN'G CO.

ADDRESS:

Woodbridge, N. J.

FACTORY AT

Spa Spring Station, P. R. R. N. J.

MANUFACTURERS OF

FIRE BRICK.

S. G. PHILLIPS, Pres., WM. H. LIVINGOOD, Sec. & Treas., Woodbridge, N. J. Reading, Pa.

WATSON FIRE BRICK CO.,

Established 1836.

Successors to JOHN R. WATSON, Parth Amboy, New Jersey, Manufacturers of

FIRE BRICK,

FOR ROLLING MILLS, BLAST FURNACES, FOUNDRIES, GAS WORKS, LIME KILNS, TANNERIES, BOILER AND GRATE SETTING, GLASS WORKS, &c. Fire Clays, Fire Sand and Kaolin for Sale.

TROY FIRE BRICK WORKS,

TROY, N. Y.

James Ostrander & Son,

Established 1848. Manufacturers of

FIRE BRICK,

Tuyers, Tiles, Blast Furnace Blocks, &c. Miners and Dealers in Woodbridge Fire Clay and Sand, Staten Island Kaolin.

ESTABLISHED 1864.

JAMES GARDNER,

Successor to GARDNER BROS.,

MANUFACTURER OF

"STANDARD SAVAGE" FIRE BRICK,

TILE & FURNACE BLOCKS,

OF ALL SHAPES AND SIZES

Miner and Shipper of "Mount Savage" Fire Clay.

WORKS, Elkville, Allegheny Co., Md.

MAIN OFFICE, Cumberland, Md., P. O. Box 93.

BRANCH OFFICE, Pittsburgh, Pa., P. O. Box 373.

S. M. Hamilton & Co., Agents, Baltimore, Md.

UNION MINING COMPANY.

Mount Savage Fire Brick.

EDWARD J. ETTING, Agent,

222 South Third St., Philadelphia, Pa.

EXCELSIOR AND

CLIPPER

LAWN MOWERS

GUARANTEED

BEST & CHEAPEST

LARGE REDUCTION

IN PRICE

HAND MOWERS

10 TO 20 IN.

HORSE MOWERS

25 TO 40 IN.

CHADBORN & COLDWELL

MANUF'G CO.

NEWBURGH, N. Y.

Send for Circular and Price List.

Self-Binders for The Iron Age.



PRICES.

The Iron Age

Self-Binder.

Full Cloth, \$1.25

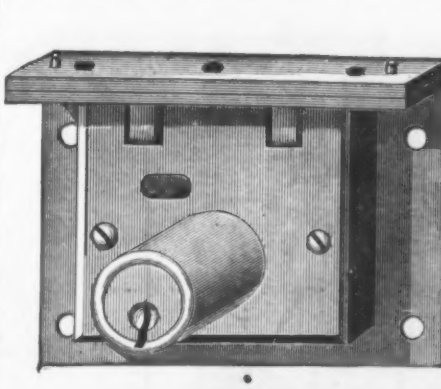
Half Roan, \$1.50

We are now prepared to supply our subscribers with an excellent self-binder for their papers, a cut of which is annexed. We call attention to the low prices at which it is offered. Address all orders to

DAVID WILLIAMS,

83 Reade Street, New York.

THE CHARLES PARKER CO.,



MERIDEN, CONN.,

Manufacturers of

CABINET LOCKS.

BIT BRACES.

No. 6.

No. 8.

No. 10.

Bores into a corner or against the wall much faster and easier than the Ratchet Brace, and does just as good work, and easier in the clear, as the ordinary Brace.

THE AMIDON CORNER BRACE.

AMIDON & WHITE,

SOLE MANUFACTURERS OF

AMIDON'S

CORNER BRACE, BARKER IMPROVED BRACE, UNIVERSAL BRACE, IMPROVED RATCHET BRACE,

FULL NICKEL PLATE OR PLAIN FINISH.

We are the SOLE OWNERS AND MANUFACTURERS of each of the above-named styles, and hereby caution the trade against purchasing the Barker Brace, or any other of our make, from any other manufacturer, both to insure from very inferior goods and from infringing on our patent rights.

No. 8.

No. 10.

No. 12.

AMIDON'S BARKER IMPROVED BRACE.

AMIDON'S UNIVERSAL BRACE.

The Barker Improved Brace is too well known to require any further mention. The Universal Brace is newer, and is positively the best cheap Brace in the market, as it centers any sized Bit, and holds perfectly secure by a Cold-Chisel Thumb-Screw.

CATALOGUES FURNISHED ON APPLICATION.

AMIDON & WHITE,

135 and 137 Main Street, Through to 10, 12 and 14 Quay Street, BUFFALO, N. Y.



THE CLARK MFG CO. BUILDERS' HARDWARE BUFFALO, N. Y.

Bemis & Call Hardware & Tool Co.



PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, case-hardened throughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite combinations of a regular Nut Wrench, thus making a combination which has no equal.

For Circulars and Price List, address

BEMIS & CALL HARDWARE & TOOL COMPANY, Springfield, Mass.

ESTABLISHED 1837.



L. & I. J. WHITE,

MANUFACTURERS OF

EDGE TOOLS and MACHINE KNIVES

Coopers', Carpenters' and Ship Tools, Cleavers, &c.

SOCKET CHISELS,

FIRMER, FRAMING, MILLWRIGHT, PAISING and CORNER.

310, 312 & 314 EXCHANGE STREET, BUFFALO, N. Y.

THE WILMOT & HOBBS MFG. CO.,

Cor. Railroad and Hancock Aves., BRIDGEPORT, CONN.,

COLD ROLLED IRON AND STEEL,

Smooth Finished up to 7 inches Width, down to 30 Strbs, and Coiled in Single Lengths up to 300 feet, as required. To order, Wilmo's Lock-Seamed Steel Tubes of Long Lengths and Different Sizes, Gun Magazine Tubes, Skate Plates, Steel Bells, Stove Ornaments, &c., &c. Also Wilmo's Copper Lightning Rods to order.

CRONK HANGER CO.,

ELMIRA, N. Y.

WROUGHT IRON SLIDE BARN DOOR HANGERS

FOR WOOD TRACK.

PATENTED FEB. 13, 1883.

Can be operated by a child.

SPECIAL POINTS:

Simplicity, Durability, Strength and Finish.

ADJUSTABLE
STAY ROLLER.



Send for sample dozen and circulars.

General Eastern and Southern Agent:

JOHN F. LOVEJOY, 102 CHAMBERS ST.
New York City.

MONTGOMERY & CO.,

IMPORTERS

Stubs' Files, Tools and Steel, Grobet Swiss Files.

CHESTERMAN'S TAPES, RULES, ETC.,

Hubert's French Emery Paper, Horseshoe Magnets, &c.

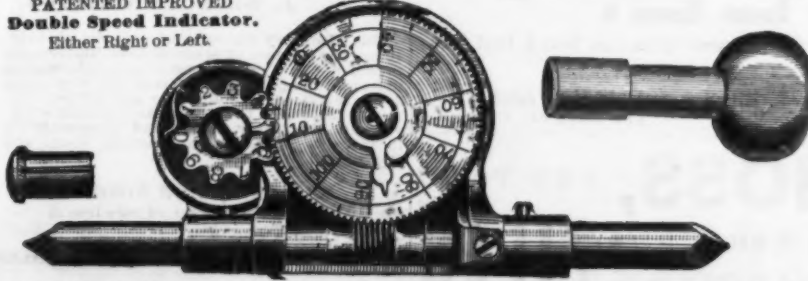
WM. SMITH & SON'S CELEBRATED MUSIC WIRE, Nos. 2 to 30.

French Sheet Steel, 3 1/4 in. wide, from 4 to 65 thousandths.

Machinists', Silvermiths', Jewelers', Die Sinkers' and Sewing Machine Manufacturers' Supplies.

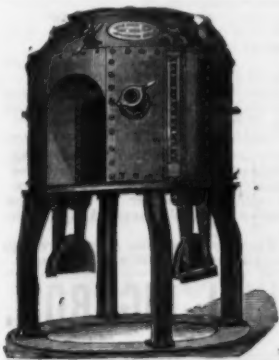
PATENTED IMPROVED
Double Speed Indicator.

Either Right or Left.



GEO. W. MONTGOMERY,
GEO. W. CHURCH.

106 Fulton St., NEW YORK.



COLLIAU PATENT FOUNDRY CUPOLA,

Made in six sizes, with capacity from one to fifteen tons per hour.
Adapted to all classes of work, for light or heavy castings, and
excels all others in Economy of Fuel and Iron. Address

Colliau Furnace Company,
DETROIT, MICH.

Write for estimates and mention this paper.



J. E. REDFIELD,

MANUFACTURER OF

TAPS, REAMERS, SCREW PLATES, &c.

ESSEX, CONN.

Our Taps are all Machine Relieved, and we guarantee them to give satisfaction.

Charles Kellogg, C. S. Maurice, Thos. C. Clarke, C. Macdonald, Geo. S. Field, Edmund Hayes,

UNION BRIDGE COMPANY,

Works: Athens, Pa.

Works: Buffalo, N. Y.

Late Kellogg & Maurice. Capacity, 14,000 tons. (Late Central Bridge Works.) Capacity, 12,000 tons.

CIVIL ENGINEERS AND CONSTRUCTORS

OF

Iron & Steel Bridges, Viaducts, Roofs,

ELEVATED RAILROADS, MARINE PIERS, &c.

For Plans, Estimates and Tenders, address

UNION BRIDGE COMPANY, 52 Wall Street, NEW YORK.

TELEPHONE CALL: NEW 203.

PRIZE MEDALLISTS.

Exhibitions of 1863, 1865, 1867, 1873, 1875, and only Award and Medal for Noiseless Steel
Shutters at Philadelphia 1876, Paris 1878, and Melbourne 1881.

CLARK, BUNNETT & CO., Limited,

Late CLARK & COMPANY,

Original Inventors and Sole Patentees of

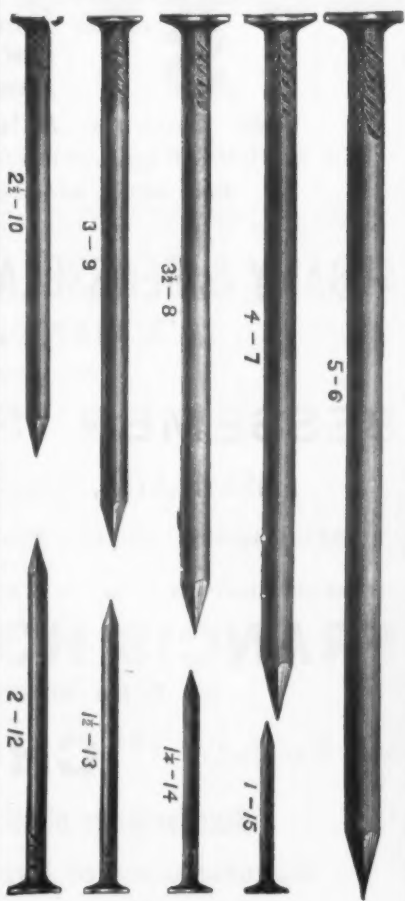
Noiseless, Self-Coiling, Revolving Steel Shutters.

Fire and Burglar Proof. Also, improved ROLLING WOOD SHUTTERS of various kinds, and Patent
METALLIC VENETIAN BLINDS.

Office and Manufactory, 162 & 164 West 27th Street, New York.

THE IP NAIL CO.,

CLEVELAND, OHIO.,



MANUFACTURERS OF

WIRE NAILS

OF ALL KINDS.

Barbed or Plain Steel, Iron and Brass
Nails, Cast Steel Wire Brads, Cast Steel
Wire Finishing Nails, Cigar Box Nails, Es-
cutcheon Pins, Wagon Nails, Clinch Nails,
Hinge Nails, Wire Spikes for Track, Bridge
and Dock Work, Tinned Nails, Galvanized
Nails.

Patented Articles of Malleable Iron.

Hammer's Malleable Iron Oilers.
Three Sizes. Nos. 1, 2 & 3.



No. 1.

Hammer's Adjustable Clamps.

Hammer's Mail Iron Hand Lamps.

Hammer's M. I. Hanging Lamps.

pattern Heavy Screw Clamps;
strongest in the market.

For sale by all the principal Hardware Dealers

Send for Price List.

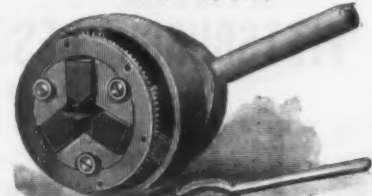
Malleable Iron Castings

of superior quality, and Hardware Specialties in
Malleable Iron made to order.

HAMMER & CO.,
BRANFORD, CONN.

THE MONTGOMERY CHUCK.

Patented May 4, 1884.



Durable. Easily Worked. Rapid.

No Spring Cutters. No Stopping

of Lathe to Chuck Work.

Doubles Working Capacity of Lathe.

The SPECIALTY MFG. CO., Sole Manuf. and Props.,

No. 3 Middle St., Cleveland, Ohio.

MILLER BROS.

Trade Mark on Steel Pens,
Ink Erasers and Pocket
Cutlery guarantees quality.

Largest makers of Fine Crucible Steel Goods in the country.

STEEL PENS with style and action suited to every hand.

Full assortment of Pens mailed on receipt of 25 cents.

Price Lists furnished on application.

Sold by all dealers.

The Miller Bros. Cutlery Co., Meriden, Ct.

GEO. M. EDDY & CO.,

Manufacturers of

Measuring Tapes

Of Cotton, Linen & Steel,

FOR ALL PURPOSES.

381 to 393 Classes Ave., Brooklyn, N. Y.

The F. F. ADAMS COMPANY, Erie, Pa.

THE LATEST THING OUT.

IDEAL MOUSE TRAP.

So perfectly simple in construction there is
nothing to get out of order, as is the case with all
other traps made on this principle. Guaranteed
to give perfect satisfaction. Send for sample
gross and you will not have any other trap that
catches mice alive. The inventor of the Ideal in-
vented all of the leading traps in the market to-
day, and he says this one is perfection. Great
care is taken in the manufacture of the Ideal, and
every trap is perfect. A single trap for inspec-
tion will be sent by mail upon receipt of sec. in
stamps.



The Cyclone Mouse Trap.

We invite the attention of dealers
to this "Novelty" in Mouse Traps.
Patented Nov. 5, 1884, and now
having an immense sale. It is
cheap, durable and attractive, and
so sensitive that the mouse who
ventures to but touch his nose to
the bait box is doomed. Our sales-
men on the road say it is the most
popular trap ever offered to the
trade. One of our men in a single
short trip sold \$4,000. The retail
price is only 10 cents each, and yet they afford big profits to the dealer. We will send a sample by mail for
inspection, upon receipt of five cent stamps. Send for our Illustrated Catalogue.



G. A. CROSBY & CO.
MANUFACTURERS OF
Presses, Dies,
AND
Special Machinery
FOR
Sheet Metal Workers.
Market and
RANDOLPH ST.
Chicago, Ill.

The SKATE can turn in
a 23-inch Circle with
all four of the Wheels
on the Floor.

No Cutting or Wearing of
the Elastic Spring.

Liberal Terms to the Trade.

Please name this Paper.

SOLD BY

Henry Sears & Co., 88 & 90 Lake St., Chicago, Ill.

AND
The Western Hdw. Co., 92 Lake St., Chicago, Ill.

The Latest and Best in the World.



For EASY running and
best MOTION it has no
EQUAL.

It is the LIGHTEST Skate
in the MARKET.

THE TENSION CAN BE
CHANGED to suit the weight
of the user in a moment. It
is practically and mechan-
ically complete.

For further particulars, address the
CHAMPION ROLLER SKATE & WAGON CO.,
Office & Factory, Nos. 1122 & 1124 N. E. St., Richmond, Ind.

WE ARE THE EXCLUSIVE MANUFACTURERS OF BYRKET'S IMPROVED DUMP AND AUTOMATIC STEEL SCRAPERS.

We manufacture the only successful Automatic Scraper
in the world. Our Dumps are the lightest and strongest
Scraper made. We use two pieces of steel pressed into
shape, which is superior to the old method of using but
one piece, for when that breaks the whole scraper is ruined
while ours is so constructed that we can replace any part
at a trifling expense. We make three
sizes, to meet the wants of all classes of
Earth Workers. Especially suited for
Contractors and Township Road Work.
Send for circulars. Manufactured by



The Champion Scraper Co.,
TROY, OHIO.

WHITE MOUNTAIN FREEZER CO.

Manufacturers of

SANDS' PATENT TRIPLE MOTION

White Mountain Ice Cream Freezer.

The only Freezer ever made having three distinct
motions, thereby producing finer, smoother Cream than
any other Freezer on the market. Acknowledged by
every one to be the best in the world. Over 300,000
in use to-day. Outside Irons Galvanized, but all inside the
can coated with Pure Black Tin. Tubs water-proof;
easily adjusted and operated. We also carry large stock
of Packing Tubs, Packing Cans, Ice Crushers, &c. Send for
Price List and Trade Discounts. Address



White Mountain Freezer Co.,

101 E. HOLLIS ST., NASHUA, N. H.

LANE'S PATENT DOOR HANGER.

THE MOST PERFECT ANTI-FRICTION HANGER IN THE MARKET, BECAUSE

It is made entirely of Wrought Iron, except the Wheel, which has a Steel Axle.

It will not break.

It is practically free from wear.

It is almost noiseless in action.

It requires no oil.

It has a broad bearing on the door, and

It is by far the most durable.

It may be used with any track.

It is a way in order.

LANE'S PATENT TRACK

is made of flat wrought iron and is easily

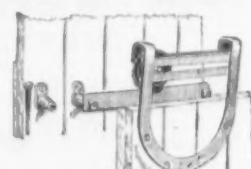
put in position.

Catches and holds no snow or ice.

Door hung thereon cannot jump the track.

Is not subject to decay.

Requires no fitting, but is ready at once.



MANUFACTURED BY LANE BROTHERS,

POUGHKEEPSIE, N. Y.

JOHN H. GRAHAM & CO., General Agents, 113 Chambers Street, NEW YORK.

HANDLES FOR MANUFACTURERS.

From Selected Stock, Thoroughly Seasoned, Well Made.

Orders solicited from close buyers who want good work

RIPLEY MANUFACTURING CO.,

Unionville, Conn.,

Manufacturers of

"Common Sense" Mouse Traps, Mallets, Porcelain-Lined
Lemon Squeezers, Boot Jacks, Faucets and Hardware.



THE HARTFORD HAMMER CO., Hartford, Conn.

Manufacturers of Solid Cast Steel Hammers. All
Hammers stamped "HARTFORD" are fully
WARRANTED - see first issue of each month.

JOHN H. GRAHAM & CO., Sole Agents,
113 Chambers St. New York.

MILLER, METCALF & PARKIN,
Pittsburgh, Pa.,
Manufacturers of
CRESCENT STEEL,
In Bars, Sheets, Cold-Rolled Strips, &c.
Polished, Compressed Drill Rods and Wire.
Warranted equal to any imported in quality, finish and accuracy.
Also Common Grades.

J. & RILEY CARR,
BAILEY LANE WORKS,
Sheffield, England.
MANUFACTURERS OF
PATENT WELDED



Iron and Steel Plow Mold Boards
Crucible Steel Face and Soft Decarbonized Steel Back or Center.

The two materials are united together by a special process of our own, not by welding under the Hammer, but in the mold while the metal is in a molten state, thus producing an absolutely solid ingot which it is impossible to break or tear asunder.

WAREHOUSE, 30 GOLD STREET, NEW YORK.

S. & C. WARDLOW,
Sheffield, England,
Manufacturers of the Celebrated
Cast and Double Shear STEEL.

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table Knives, Mining Tools, Dies, Files, Clock and other Springs, and Tools of every variety.

Warehouse, 95 John Street, New York.

WILLIAM BROWN, Representative.

JESSOP'S BEST TOOL STEEL
IN GREAT VARIETY OF SIZES.

Gold Medals awarded at Exhibitions of Paris, 1875, and Melbourne, 1881.

ROCK DRILL STEEL, in bond or duty paid.
Sheet Steel,
Best Circular Saw Plates,
Double Shear Steel,
Die Steel, &c.
MANUFACTORY, Sheffield, England.

JESSOP'S STEEL

As a SPECIALTY, we offer our Best Tool and Die Steel, Also Annealed Die Blocks, from Stock or on importation orders at short notice.
Branch Warehouses Throughout the United States and Canada.

WILLIAM JESSOP & SONS, LIMITED,
91 JOHN STREET, NEW YORK.

CLEVELAND ROLLING MILL CO.,
CLEVELAND, OHIO.
MANUFACTURERS OF

BESSEMER AND SIEMENS-MARTIN STEEL BLOOMS AND BILLETS, BESSEMER STEEL RAILS, IRON RAILS & FASTENINGS.
Steel Street Rails, Wire, STEEL TIRE and FORGINGS, Iron and Steel Angles, Bar and Spring Steel, SOFT WELDING STEEL for Tools and Agricultural Work, Corrugated Roofing and Siding, IRON AND STEEL BOILER PLATE, Galvanized and Black Sheet Iron, STANDARD CAST STEEL.

WESTERN AGENCY, 91 Lake St., Chicago. NEW ENGLAND AGENCY, 339 Franklin St., Boston. S. D. JOHN WALKER & CO., Agents. C. DICKERSON, Agent. New York Agency, 25 Astor House. CINCINNATI AGENCY, 181 Walnut St., CHARLES H. MELISH, Agent.

W. W. SCRANTON, President.

WALTER SCRANTON, Vice-President.

E. F. KINGSBURY, Sec'y and Treas.

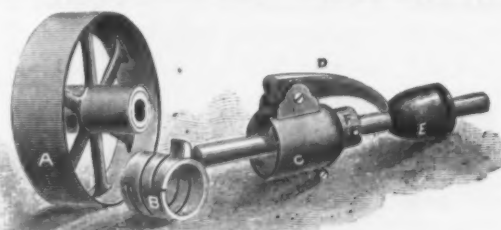
THE SCRANTON STEEL COMPANY,
MANUFACTURERS OF
STEEL RAILS & BILLETS.
Works at Scranton, Pa.
New York Office, 56 Broadway.

THE MIDVALE STEEL CO.,
NICETOWN, PHILADELPHIA.

Best Warranted Cast Steel for Machinists' Tools,
Taps, Dies, Punches, Shear Blades, Chipping Chisels and Granite Rock Drills,
Extra Mild Center Steel, special for Taps;
MACHINERY AND CAST SPRING STEEL HEAVY AND LIGHT FORGINGS.

Warehouse, No. 12 North 5th St., Philadelphia.

Address A. M. F. Watson, General Sales Agent.



BARNES' PATENT
SPIRAL SLEEVE
FRICTION
CLUTCH PULLEYS

AND
CUT-OFF COUPLINGS.
Best and Cheapest in the Market.
H. N. BATES & CO.
Manufacturers,
No. 358 Atlantic Avenue,
BOSTON, MASS.
Send for Catalogue.

STEEL Gautier Steel.
See Page 3.

LABELLE STEEL WORKS.
SMITH, SUTTON & CO.,
MANUFACTURERS OF ALL KINDS OF
STEEL.

Also Springs, Axles, Rake Teeth, &c.
OFFICE & WORKS, Ridge, Lighthill & Belmont Sts., & Ohio River, Allegheny.
Post Office Address, PITTSBURGH, PA.
Represented at Boston by WETHERELL BROS., 31 Oliver St.; at Philadelphia by JAMES C. HAND & CO., 614 and 616 Market St.; at Cleveland by CONNIT, WICK & CO., 123 Water St.

ALBANY & RENSSLAER IRON & STEEL CO.,
TROY, N. Y.,
MANUFACTURERS OF

BESSEMER STEEL RAILS,
FISH PLATES, BOLTS, NUTS, SPIKES, &c.
Machinery Steel, Merchant and Ship Iron.

CHESTER GRISWOLD, V.-Pres't, Duncan Building, 11 Pine St., N. Y. City.

FRANCIS HOBSON & SON,
97 John Street, NEW YORK.

Sole Manufact'rs of "CHOICE" Extra Cast Steel.

Manufacturers of all Descriptions of Steel.

Manufacturers of Every Kind of Steel Wire.

Don Works, Sheffield, England.

CHAS. HUGILL, Agent.

ANDERSON, DU PUY & CO.,
(Successors to ANDERSON & CO.,) Manufacturers of all Descriptions of
STEEL. Agricultural, &c.

Tool, Machinery, Works and Office at Chartiers Station P. & L. E. R. R. Branch Office, Cor. Ross & First Aves., PITTSBURGH, PA.
D. H. KENT & CO., Limited, Agents, 1009 Arch St., Phila., Pa. M. T. MILES & SON, Western Agents, 170 Lake St., Chicago.

80 John St., **F. W. MOSS,** NEW YORK.
STEEL "MOSS" and FILES
"MOSS & GAMBLE'S"
IMPROVED MILD-CENTERED CAST STEEL FOR TAPS, &c.

Warranted Superior to any Steel in the Market, either English or American, for every purpose.

Also, Combination Chrome Steel and Iron for Safes, Jails and Deposit Vaults.

Send for Circular and Price List

Chrome Steel Works,

Kent Avenue and Keap Street, BROOKLYN, E. D., N. Y.

Chicago Branch,

S. D. KIMBARK, Agent.

Cincinnati Branch,

N. E. cor. 5th & Main Streets.

THE MONTOUR IRON & STEEL COMPANY.
WORKS AT DANVILLE, PA.

PIG IRON, T AND STREET RAILS,

RAIL JOINTS AND SPIKES,

Bar Iron, Mine Car Wheels, Axles and Breaker Machinery.

W. E. C. COKE, President, Reading, Pa. F. P. HOWE, Gen'l Supt., Danville, Pa. S. W. INGERSOLL, Treasurer, 208 South Fourth St., Philadelphia, Pa.

PITTSBURGH BESSEMER STEEL CO. (LIMITED),

STEEL RAILS
LIGHT RAILS A SPECIALTY.

P. O. Address, 48 Fifth Avenue, Pittsburgh, Pa.

FLORENCE TACK CO.,
FLORENCE, MASS.,
MANUFACTURERS OF EVERY VARIETY OF

Tacks, Small Nails and Staples.



* We would call attention to our improved **CARPET STAPLE,** manufactured from HALF-ROUND STEEL WIRE, having the advantage of a flat surface underneath, without the weakness of a thin flat bar. The points bent, as shown at b, act as a brace, reducing the liability of bending the staple when driving.

R. MUSHET'S
Special Steel

FOR
LATHES, PLANERS, &c.

Turns out at least double work by increased speed and feed, and cuts harder metals than any other steel. Neither hardening nor tempering required.

Sole Makers,
SAMUEL OSBORN & CO.,
Sheffield, England.

Represented in the United States by
B. M. JONES & CO.,
Nos. 11 & 13 Oliver Street, BOSTON.

NAYLOR & CO.,
99 John St., New York,
IMPORTERS OF

STEEL AND IRON RAILS,
Steel Tires and Axles, Tin and Terne Plates, Swedish and Norway Iron, Bessemer Steel and Iron WIRE RODS,

Pig Iron, Spiegeleisen, Ferromanganese, Scrap Steel and Old Iron Rails.

SELLING AGENTS
FOR
Norway Steel and Iron Company, SOUTH BOSTON.

Manufacturers of
STEEL COMPRESSED SHAFTING,
"Benzon" Homogeneous Plates For Rollers, Fire-boxes, &c.
SPRING STEEL,
And all other kinds of
Martin-Siemens Steel and Iron.

The Iron-Masters' LABORATORY.

Exclusively for the
Analysis of Ores of Iron, Pig and Manufactured Iron, Steels, Limestone, Clays, Slags and Coal for Practical Metallurgical Purposes.
No. 339 Walnut St., Philadelphia.
With Branch at Warrenton, Virginia,
J. BLODGET BRITTON.

This laboratory was established in 1866, at the instance of a number of practical Iron Masters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes, the object being to make it at once a convenient, practically useful, and comparatively inexpensive adjunct to the Furnace, Forge and Rolling Mill.

CHARGES TO IRON WORKS:
For determining the per cent. of Pure Iron in an Ordinary Ore, \$4.00
For the per cent. of Pure Iron, Sulphur and Phosphorus in do. 12.50
For each additional constituent of usual occurrence, 1.50
For those of unusual occurrence or difficult to determine, the charge must necessarily depend upon circumstances.
For determining the per cent. of Sulphur or Phosphorus in Iron or Steel, 7.00
For each additional constituent of usual occurrence, 6.00
For the per cent. of Carbonate of Lime, and insoluble Silicious Matter in a Limestone, 10.00
For each additional constituent, 3.00
For the per cent. of Water, Volatile Combustible Matter, Fixed Carbon, and Ash in a Coal, 12.50
For determining the constituents of a Clay, Slag, Coke, or of an Ash in Coal, the charges will correspond with those for the constituents of an Ore.
For a written opinion or letter of instruction the charge must necessarily depend upon circumstances.
Printed instructions for obtaining proper average samples for analysis furnished on application.

BRIER HILL PIG IRON.

Annual Capacity, 100,000 Tons.

WE MAKE FOUR GRADES, TO-WIT:

BESSEMER, for Bessemer Rails and Open Hearth use; made from Lake Superior ores.

BRIER HILL SCOTCH, used as a softener and for carrying scrap; equal to Imported Scotch.

BRIER HILL or TOD FOUNDRY, extra strength; made from Lake Superior ores.

IRON RIVER FOUNDRY, medium strength; suitable for small castings and general use.

Special attention given to grading our Foundry Iron. Write for Prices.

THE BRIER HILL IRON & COAL CO.,
YOUNGSTOWN, OHIO.

A. PARDEE, Hazleton, Pa. J. G. FELL, Phila.

A. PARDEE & CO.,
237 South Third Street,
PHILADELPHIA,

No. 111 Broadway, New York,
MINERS AND SHIPPERS OF

Lehigh Coals.

The following superior and well-known Lehigh Coals are mined by ourselves and firms connected with us, viz.:

A. Pardee & Co. HAZLETON, CRANBURY, SUGAR LOAF.
Pardee, Bro. & Co. LATTIMER.
Calvin Pardee & Co. HOLLYWOOD.
Pardee, Sons & Co. MT. PLEASANT.

THOS. FIRTH & SONS, Limited,
SHEFFIELD,

Crucible Cast Steel.

JERE. ABBOTT & CO.,

AGENTS AND IMPORTERS OF

SWEDISH IRON,

35 Oliver St., BOSTON. 23 Cliff St., NEW YORK.

GUSTAF LUNDBERG,

AGENT FOR

N. M. HÖGLUND'S SONS & CO.,

OF STOCKHOLM.

SWEDISH & NORWAY IRON,

38 KILBY STREET, BOSTON.

ALBERT POTTS, Philadelphia Agent, 234 & 236 N. Front Street.

PAGE, NEWELL & CO.,

139 MILK STREET, BOSTON.

IMPORTERS OF

Swedish and Norway Iron,

INCLUDING

Charcoal, Siemens-Martin and Bessemer Productions, Bars, Shapes, Rods, Billets, Blooms, Wrought Scrap Iron, Scrap Steel, &c.

DELIVERIES MADE AT ALL PROMINENT AMERICAN, CANADIAN AND PROVINCIAL PORTS.

Swedish (Norway) Iron & Steel.

Lewander & Co.,

AGENTS FOR

L. G. Bratt & Co., of Gothenburg, Sweden.

BRANCH OFFICE:

MAIN OFFICE:

116 La Salle St., CHICAGO.

12 Post Office Square, Boston, Mass.

1017

CROWN WATER METERS

Sold During the Month of May.

NATIONAL METER COMPANY,

51 Chambers Street, NEW YORK.

JOHN C. KELLEY, Prest.

HENLEY'S CHALLENGE ROLLER SKATE.

THE LATEST AND BEST AND MOST COMPLETE SCIENTIFIC

SKATE

IN THE MARKET.

PATENTED

October 16, 1880,

AND

August 23, 1881



LIBERAL TERMS TO THE TRADE.

For Prices, Circulars and further particulars, address, mentioning *The Iron Age*,

M. C. HENLEY, Patentee and Manufacturer,

REMOVED TO NEW FACTORY, 1220 TO 1224 NORTH 8 ST., RICHMOND, IND.

J. HAISH & CO.,

SOLE MANUFACTURERS OF

THE RATTLE.



Haish's 8 Barb Steel Fence Wire, the Pioneer and Duplex Galvanized and Enamelled; barbs locked on both wires, and possesses more excellent qualities than any fence ever produced. We also call your attention to the Jacob Haish Wire Fence Stretcher, Double Crank, Double Rope, Center Draft, and offered to the public as the best device in the world for stretching wire fences. Every Stretcher guaranteed to do perfect work or no sale. Send for sample and price list. Liberal discount to jobbers.

HOME OFFICE, DE KALB, ILL.

CHEMICALS AND APPARATUS

FOR THE ANALYSIS OF

ORES, IRON, STEEL, FUEL, FLUXES, FURNACE GASES, &c.,

Our Specialty. Being direct Importers and Manufacturers we can offer superior inducements.

REIMER & AMEND,

Nos. 205 to 211 Third Avenue.

Eighteenth Street Station Elevated R. R.

NEW YORK. Illustrated Catalogue Mailed on Application.

LIST OF

TRADE MARKS, BRANDS, &c.

IN ORDER to meet a decided and constantly growing want, as made known and emphasized by almost daily inquiries asking for names and addresses of makers of iron, tools, tin plates, hardware, steel, machinery, oils, varnishes, japans, &c., &c., it has been decided to include in the

Ironmonger Diary and Text Book for 1885

(now in course of preparation) as complete a list as possible of trade-marks, brands, specialties, &c., made and in use in all parts of the world, similar to that contained in our Diary for 1884.

This list excludes all ordinary trade announcements proper, and is strictly confined to trade-marks and brands, whether blocks, electros or other appliances for illustrations, with just sufficient letterpress to describe the kind of article to which the mark, &c., is applied, and the names and addresses of the owners or lawful users. For the sake of uniformity in space and charges, each mark occupies a space measuring 1 inch deep by 1½ inches wide, and the uniform charge is \$2.50 (10s.) only for each such space, payable in advance unless we have already an open advertising account with the firm giving the order.

The advertisements so inserted are printed on colored paper, classified under suitable heads, and so arranged as to make them both effective and useful.

Blocks or electros, &c., of marks or brands which may be too large are reduced by us at cost price (roughly about \$1 each) to the requisite size on receipt of remittance along with the cash for the cost of advertisement.

AMERICAN MANUFACTURERS AND EXPORTERS

of agricultural machinery and implements, "notions," general machinery, axes, hatchets and tools generally, nails, cutlery, electro-plated wares, clocks, safes, watches, oils, varnishes, japans, petroleum, paints, &c., &c., are strongly advised to take advantage of this excellent opportunity of placing their marks, &c., in a list which is constantly referred to all over the world, and especially (besides Great Britain) in Australia, New Zealand, India, Ceylon, South Africa, the West Indies and the British Colonies of North America.

Particulars, blocks or electros, and remittances, may be forwarded through any of the offices of the *Iron Age*, or direct to the publisher,

42 CANNON ST., LONDON, E. C.

CROISSANT'S IMPROVED KELLER PAT. SAW SET.

CHAS. CROISSANT & BRO., Albany, N. Y.



The above cut represents the different parts of Croissant's Improved Keller Saw Set. The handles F and F' are milled at I and V so that they fit perfectly, and when placed together the set can be operated independent of the screw L, which is used only to keep the handles together. The tooth set G is made from the best cast steel and tempered, and has a flat surface at both ends, thus forming six corners, any of which can be used in setting a saw. T is the socket in which the tooth set G fits. If at any time one of the corners of the tooth set G should break or otherwise become unfit for use the tooth set can be removed and one of the other corners brought into use by simply turning the tooth set G about and again placing it in position in socket T. This can be done until all of the corners have been used, thus really giving the operator six sets in one.

ADJUSTABLE ARM CLOTHES RACK



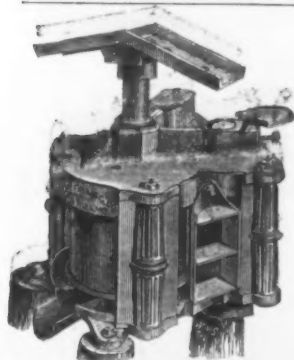
This Rack may be fastened to the side of the house with two screws, and when spread in position, consisting of eight 28-inch round arms, which are equal to 18 feet of line. When not in use the arms may be dropped entirely out of the way.

MANUFACTURED BY

Ray Hubbell Mfg. Co.,

Northville, N. Y.

Send for Price List.



GEO. K. OYLER MFG. CO.,
MANUFACTURERS OF
Sugar Cane Machinery
AND
EVAPORATORS.
ST. LOUIS, MO., U. S. A.

WRITE FOR CATALOGUE.

FRUIT WINE
& JELLY PRESS
SAUSAGE STUFFER
MOLASSES
SELF MEASURING FAUCET.
ENTERPRISE MFG. CO.
THIRD & DAUPHIN STS. PHILADELPHIA
Mrs. Potts' COLD HANDLE SADD IRONS
SOLD BY ALL HARDWARE DEALERS
SEND FOR ILLUSTRATED CATALOGUE
SMOKED BEEF SHAVES
MEAT CHOPPER
BUNG HOLE BORER TOBACCO & ROOT CUTTER

PEUGEOT FRÈRES,
MANUFACTURERS OF
Finest Grades of Steel

FOR WATCH, CLOCK AND OTHER SPRINGS,
Band Steel for Saws for Metal and Wood. Steel for all Mechanical Uses. The
"Lion" Brand of Band Saws Best and Cheapest Made.
Correspondence Solicited.

McCOY & SANDERS,
AGENTS FOR UNITED STATES AND CANADA
26 WARREN STREET, NEW YORK.

CLEVELAND BLOCK CO.,
MANUFACTURERS OF
TACKLE BLOCKS
WITH
MALLEABLE IRON SHELLS.
As compared with Wooden Blocks, these are Stronger,
Lighter, Simpler, more ship-shape, vastly more durable,
cheaper, and have wider scores. They have all the advantages
of Wrought Iron Blocks, and more, at much less cost. Illus-
trated Catalogues mailed from
129 River St., Cleveland, Ohio,
or New York Warehouse, 100 Chambers St., HORACE F. SISE, Agent;
DODGE, HALEY & CO., 31 Oliver St., Boston; GUDLIS & AUSTIN,
109 Lake St., Chicago; SIMMONS HARDWARE CO., St. Louis.

THE CINCINNATI CORRUGATING CO.,
CINCINNATI, OHIO.
MANUFACTURERS OF
CORRUGATED SHEET IRON.
Superior Corrugated
Roofing, Siding, Cell-
ing, Arches, Lath,
Etc.
For Rolling
Mills, Blast Furnaces,
Foundries, Machine
Shops, Car Shops, Boiler
and Engine Rooms, Etc.
Fire, Water and Wind Proof. Light, Cheap and Durable.
Send for Descriptive Illustrated Catalogue.

"MORTON'S METAL"

(Registered Trade-Mark, May 1st, 1881.)

CABLE CHAIN.
CABLE AND CHAMPION SASH-CHAINS
AND
PATENTED ATTACHMENTS.
The most RELIABLE and CHEAPEST article in the market for sus-
pending WINDOW SASHES. Has Great Tensile Strength, can
be easily applied to any window, and gives SATISFACTION wherever used.
Liberal Discount to the Trade. Now in use in all the leading
cities throughout the United States. Have just furnished Chains to the
following buildings: Mutual Life Insurance Co., Hoffman House,
Williamsburg Fire Insurance Co. and the Navajo Flats.
Samples Sent to Any Hardware House Free on Application.
MANUFACTURED ONLY BY
THOMAS MORTON,
65 ELIZABETH ST., NEW YORK.

JOHN T. LEWIS & BROS.,
No. 231 South Front St.,
PHILADELPHIA.



TRADE MARK.
MANUFACTURERS OF
Pure White Lead, Red Lead, Litharge,
Orange Mineral, Linseed Oil,
AND PAINTERS' COLORS.

JOHN JEWETT & SONS
Manufacturers of the well-known brand of
WHITE LEAD.



TRADE MARK.
ALSO MANUFACTURERS OF
LINSEED OIL.
181 Front Street, NEW YORK.



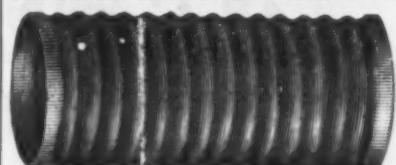
The Atlantic White Lead and Linseed Oil Co.,
Manufacturers of
White Lead (Atlantic), Red Lead, Lith-
arge, Glass Makers' Litharge and
Orange Mineral;
LINSEED OIL,
Raw, Refined and Billed.
ROBERT COLGATE & CO.,
237 Pearl St., NEW YORK.

SALEM LEAD COMPANY,
CORPORATED AND MANUFACTURERS OF
PURE WHITE LEAD.



ALSO MANUFACTURERS OF
Lead Pipe and Narrow Sheet Lead.
SALEM, MASS.
F. A. BROWN, Treas.

FOX'S
CORRUGATED BOILER FURNACES.



1. They are made of a single steel plate, welded
at the bottom, with no joint in contact with the
flame.
2. They give 50 per cent. more evaporative
power.
3. They throw off all scale by their elasticity.
4. They do not destroy themselves by the varia-
tion of temperature, contracting and expanding
as they do like an accordion. They have not
enough stiffness to work against the boiler heads.
5. They require, to comply with the rules of the
Board of Trade in England, only one-half the
thickness of plate of plain furnaces for equal
working pressure.
6. Where a plain furnace of equal length, diam-
eter and thickness collapsed at 225 pounds, the
Corrugated stood 1000 pounds per square inch.
Since five years 700 steamers were fitted with
these furnaces, among them the Alaska, Oregon,
City of Rome, Servia, Elbe, Werra, Fulda, &c.
Perfect safety and greatest economy combined.
For particulars, apply to
Hartmann, Le Doux & Maecker,
134 PEARL ST., NEW YORK,
Sole Agents and Assignees of U. S. Patents.



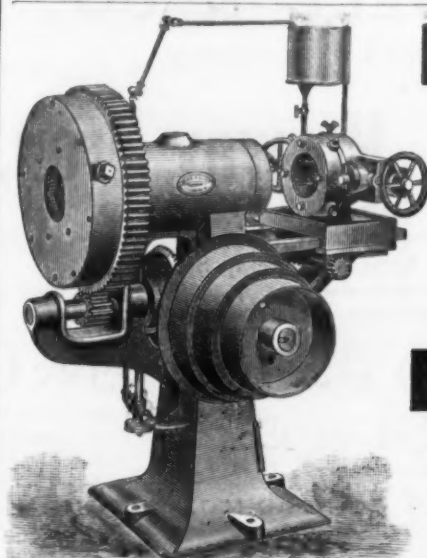
Prouty's Patent
PEERLESS
FORCE PUMP.

Has Self-Adjustable Foot Rest.
NEW AUTOMATIC COMPENSATING
PACKING.

It will throw a continuous jet FROM
FORTY TO SIXTY FEET. A new pattern
jet and spray nozzle is sent with each
pump.

Especially attention is called to the
material and workmanship exhibited
in these pumps.

THE NEW ENGLAND BUTT CO.
PROVIDENCE, R. I.
NEW YORK OFFICE, 99 Chambers St.



Don't You?

Have sufficient Pipe-Wire
about your Mill, Factory
or Shops to make a Power-
ful, Convenient, and very
Compact

Pipe-Cutting Machine

Soon pay for itself?

Don't You?

Further think it might pay
you to write us for particu-
lars of the "ECLIPSE"
MACHINES, for which we
claim many desirable fea-
tures, including Moderate

Prices. We build the "Eclipse" for both Hand and Power
use. Mention this Paper and address,

PANCOAST & MAULE,
PHILADELPHIA, PA.

NEW CHAMPION FORCE PUMP
HAS
Vacuum Chamber and Air Chamber,
Producing a continuous flow of water, both in suction and dis-
charge. Works smoother and easier than any other force pump
in the market. Has Seamless Drawn Brass Cylinders and no
stuffing boxes. Never freezes in winter, and is not liable to get
out of order. With Hose Attachment it is valuable as a fire
protection, and for sprinkling lawns, gardens, &c. It is
specially adapted for all kinds of wells—dug, drilled or driven
—and for pumping water long distances from springs.

CLARK'S IMPROVED
Ratchet Stocks, Dies & Pipe Vises
FOR USE BY
Plumbers, Gas Fitters and Pump Dealers.
With the Ratchet Stock pipe can be threaded in a corner, down in wells, or in
positions that would be inaccessible with other tools.
Send for Circulars and Price Lists to
CLARK, BROTHERS, Mfrs., Belmont, N. Y., U. S. A.

NORTHFIELD KNIFE CO.
Superior Pocket Cutlery,
WITH HAND-FORGED BLADES.

Finest Quality Shears and Scissors,
FULL NICKEL-PLATED. NORTHFIELD, CONN.

V. G. HUNDLEY,
PROPRIETOR OF
NORTH CAROLINA HANDLE CO.



MANUFACTURER OF
Handles and Spokes,
79 Reade Street and 97 Chambers Street,
HARDWARE COMMISSION MERCHANT. NEW YORK.

SHEET-IRON BUILDING MATERIALS.

ROOFING. Patent Cap Beam Roofing, in Four Styles. In Sheets
or Rolls.
SIDING. Crimped Iron, for Siding or Roofing for Elevators,
Mills and Factories.
CEILING. Panoled and Crimped Iron Ceiling. Durable, Attractive,
Fire-proof.
Send for Prices and Circulars to
A. NORTHROP & CO., 97 First Ave., PITTSBURGH.

PHILADELPHIA.

Lloyd & Sons Hardware Co.
 Terms, 30 days. For 60 or 90 days, interest added at 8 per cent. per annum.

Acetylene.
 Peter Wright's, 100% @ 11 1/2
 Over 200 lbs. @ 11 1/2
 Trenton, 100% @ 11 1/2
 Eagle Anvil, American, 100% @ 11 1/2
Apple Parers.
 Globe Apple Parer, 50c net
 Penn Apple Parer, 50c net
 White Mountain, 50c net
 Lots of 10 to 25 dozen, special prices.

Axes.
 Hunt's Kentucky and Yankee, 75c net.
 Robert Mann, 75c net.
 Richard Chief, 75c net.
 Beveled Axes, 75c net.
 Double Bit Axes, 75c net.
Augers and Auger Bits.—New List, January 7, 1880.

Bates' Nut Augers, 60c net.
 Cook's Augers, 40c net.
 Watson's Ship Augers, 15c net.
 Benjamin Pierce Auger Bits, 40c net.
 New Haven Copper Company, 40c net.
 Speck's Augers and Bits, 40c net.
 Swift's Ship Augers, 40c net.
 Cook's Auger Bits, 40c net.
 Jennings' Auger Bits, new list, Jan. 1, 1884, 25c net.
 Bonney's Pat. Hol. Augers, 45c net.
 Stearns' Pat. Hol. Augers, 45c net.
Balances.
 Light and Common, 40c net.

Bells.
 Bevin Bros. Mfg. Co. Light Hand Bells, 70c net.
 Swiss Pattern Hand Bells, 75c net.
 Connell's Door Bells, 15c net.
 Bell Western & Kentucky Cows, new list, 75c net.

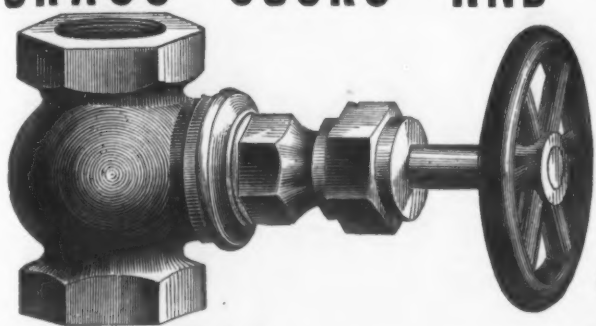
Bearing Machines.
 Wright, without Augers, List, 50c net.
 Circular, without Augers, List, 75c net.
 Philadelphia Carriage Works, new list, 75c net.
 Stanley, Wrought Shutter, 75c net.

Braces.—Barber's, 40c net.
 Backus, 40c net.
 Spofford, 40c net.
 American Ball, 40c net.

Butts.—Cast Fast Joint, Narrow, 40c net.
 Cast Fast Joint, Broad, 40c net.
 Cast Loose Joint, Narrow, 40c net.
 Cast Loose Joint, Broad, 40c net.
 Cast Acorn, Loose Pin, 40c net.
 Cast Acorn, Japanese, 40c net.
 Cast Mayer's Loose Joint, 40c net.
 Wrought Loose Joint, 40c net.
 Wrought Taper Hinges and Back Flaps, 40c net.

Chains.—German Hater and Coll. List, June, 1880.
 Galvanized Pump, 40c net.
 Best Proof Chain, 40c net.
 12 1/2, 15, 17 1/2, 20, 22 1/2, 25, 27 1/2, 30, 32 1/2, 35, 37 1/2, 40, 42 1/2, 45, 47 1/2, 50, 52 1/2, 55, 57 1/2, 60, 62 1/2, 65, 67 1/2, 70, 72 1/2, 75, 77 1/2, 80, 82 1/2, 85, 87 1/2, 90, 92 1/2, 95, 97 1/2, 100, 102 1/2, 105, 107 1/2, 110, 112 1/2, 115, 117 1/2, 120, 122 1/2, 125, 127 1/2, 130, 132 1/2, 135, 137 1/2, 140, 142 1/2, 145, 147 1/2, 150, 152 1/2, 155, 157 1/2, 160, 162 1/2, 165, 167 1/2, 170, 172 1/2, 175, 177 1/2, 180, 182 1/2, 185, 187 1/2, 190, 192 1/2, 195, 197 1/2, 200, 202 1/2, 205, 207 1/2, 210, 212 1/2, 215, 217 1/2, 220, 222 1/2, 225, 227 1/2, 230, 232 1/2, 235, 237 1/2, 240, 242 1/2, 245, 247 1/2, 250, 252 1/2, 255, 257 1/2, 260, 262 1/2, 265, 267 1/2, 270, 272 1/2, 275, 277 1/2, 280, 282 1/2, 285, 287 1/2, 290, 292 1/2, 295, 297 1/2, 300, 302 1/2, 305, 307 1/2, 310, 312 1/2, 315, 317 1/2, 320, 322 1/2, 325, 327 1/2, 330, 332 1/2, 335, 337 1/2, 340, 342 1/2, 345, 347 1/2, 350, 352 1/2, 355, 357 1/2, 360, 362 1/2, 365, 367 1/2, 370, 372 1/2, 375, 377 1/2, 380, 382 1/2, 385, 387 1/2, 390, 392 1/2, 395, 397 1/2, 400, 402 1/2, 405, 407 1/2, 410, 412 1/2, 415, 417 1/2, 420, 422 1/2, 425, 427 1/2, 430, 432 1/2, 435, 437 1/2, 440, 442 1/2, 445, 447 1/2, 450, 452 1/2, 455, 457 1/2, 460, 462 1/2, 465, 467 1/2, 470, 472 1/2, 475, 477 1/2, 480, 482 1/2, 485, 487 1/2, 490, 492 1/2, 495, 497 1/2, 500, 502 1/2, 505, 507 1/2, 510, 512 1/2, 515, 517 1/2, 520, 522 1/2, 525, 527 1/2, 530, 532 1/2, 535, 537 1/2, 540, 542 1/2, 545, 547 1/2, 550, 552 1/2, 555, 557 1/2, 560, 562 1/2, 565, 567 1/2, 570, 572 1/2, 575, 577 1/2, 580, 582 1/2, 585, 587 1/2, 590, 592 1/2, 595, 597 1/2, 600, 602 1/2, 605, 607 1/2, 610, 612 1/2, 615, 617 1/2, 620, 622 1/2, 625, 627 1/2, 630, 632 1/2, 635, 637 1/2, 640, 642 1/2, 645, 647 1/2, 650, 652 1/2, 655, 657 1/2, 660, 662 1/2, 665, 667 1/2, 670, 672 1/2, 675, 677 1/2, 680, 682 1/2, 685, 687 1/2, 690, 692 1/2, 695, 697 1/2, 700, 702 1/2, 705, 707 1/2, 710, 712 1/2, 715, 717 1/2, 720, 722 1/2, 725, 727 1/2, 730, 732 1/2, 735, 737 1/2, 740, 742 1/2, 745, 747 1/2, 750, 752 1/2, 755, 757 1/2, 760, 762 1/2, 765, 767 1/2, 770, 772 1/2, 775, 777 1/2, 780, 782 1/2, 785, 787 1/2, 790, 792 1/2, 795, 797 1/2, 800, 802 1/2, 805, 807 1/2, 810, 812 1/2, 815, 817 1/2, 820, 822 1/2, 825, 827 1/2, 830, 832 1/2, 835, 837 1/2, 840, 842 1/2, 845, 847 1/2, 850, 852 1/2, 855, 857 1/2, 860, 862 1/2, 865, 867 1/2, 870, 872 1/2, 875, 877 1/2, 880, 882 1/2, 885, 887 1/2, 890, 892 1/2, 895, 897 1/2, 900, 902 1/2, 905, 907 1/2, 910, 912 1/2, 915, 917 1/2, 920, 922 1/2, 925, 927 1/2, 930, 932 1/2, 935, 937 1/2, 940, 942 1/2, 945, 947 1/2, 950, 952 1/2, 955, 957 1/2, 960, 962 1/2, 965, 967 1/2, 970, 972 1/2, 975, 977 1/2, 980, 982 1/2, 985, 987 1/2, 990, 992 1/2, 995, 997 1/2, 1000, 1002 1/2, 1005, 1007 1/2, 1010, 1012 1/2, 1015, 1017 1/2, 1020, 1022 1/2, 1025, 1027 1/2, 1030, 1032 1/2, 1035, 1037 1/2, 1040, 1042 1/2, 1045, 1047 1/2, 1050, 1052 1/2, 1055, 1057 1/2, 1060, 1062 1/2, 1065, 1067 1/2, 1070, 1072 1/2, 1075, 1077 1/2, 1080, 1082 1/2, 1085, 1087 1/2, 1090, 1092 1/2, 1095, 1097 1/2, 1100, 1102 1/2, 1105, 1107 1/2, 1110, 1112 1/2, 1115, 1117 1/2, 1120, 1122 1/2, 1125, 1127 1/2, 1130, 1132 1/2, 1135, 1137 1/2, 1140, 1142 1/2, 1145, 1147 1/2, 1150, 1152 1/2, 1155, 1157 1/2, 1160, 1162 1/2, 1165, 1167 1/2, 1170, 1172 1/2, 1175, 1177 1/2, 1180, 1182 1/2, 1185, 1187 1/2, 1190, 1192 1/2, 1195, 1197 1/2, 1200, 1202 1/2, 1205, 1207 1/2, 1210, 1212 1/2, 1215, 1217 1/2, 1220, 1222 1/2, 1225, 1227 1/2, 1230, 1232 1/2, 1235, 1237 1/2, 1240, 1242 1/2, 1245, 1247 1/2, 1250, 1252 1/2, 1255, 1257 1/2, 1260, 1262 1/2, 1265, 1267 1/2, 1270, 1272 1/2, 1275, 1277 1/2, 1280, 1282 1/2, 1285, 1287 1/2, 1290, 1292 1/2, 1295, 1297 1/2, 1300, 1302 1/2, 1305, 1307 1/2, 1310, 1312 1/2, 1315, 1317 1/2, 1320, 1322 1/2, 1325, 1327 1/2, 1330, 1332 1/2, 1335, 1337 1/2, 1340, 1342 1/2, 1345, 1347 1/2, 1350, 1352 1/2, 1355, 1357 1/2, 1360, 1362 1/2, 1365, 1367 1/2, 1370, 1372 1/2, 1375, 1377 1/2, 1380, 1382 1/2, 1385, 1387 1/2, 1390, 1392 1/2, 1395, 1397 1/2, 1400, 1402 1/2, 1405, 1407 1/2, 1410, 1412 1/2, 1415, 1417 1/2, 1420, 1422 1/2, 1425, 1427 1/2, 1430, 1432 1/2, 1435, 1437 1/2, 1440, 1442 1/2, 1445, 1447 1/2, 1450, 1452 1/2, 1455, 1457 1/2, 1460, 1462 1/2, 1465, 1467 1/2, 1470, 1472 1/2, 1475, 1477 1/2, 1480, 1482 1/2, 1485, 1487 1/2, 1490, 1492 1/2, 1495, 1497 1/2, 1500, 1502 1/2, 1505, 1507 1/2, 1510, 1512 1/2, 1515, 1517 1/2, 1520, 1522 1/2, 1525, 1527 1/2, 1530, 1532 1/2, 1535, 1537 1/2, 1540, 1542 1/2, 1545, 1547 1/2, 1550, 1552 1/2, 1555, 1557 1/2, 1560, 1562 1/2, 1565, 1567 1/2, 1570, 1572 1/2, 1575, 1577 1/2, 1580, 1582 1/2, 1585, 1587 1/2, 1590, 1592 1/2, 1595, 1597 1/2, 1600, 1602 1/2, 1605, 1607 1/2, 1610, 1612 1/2, 1615, 1617 1/2, 1620, 1622 1/2, 1625, 1627 1/2, 1630, 1632 1/2, 1635, 1637 1/2, 1640, 1642 1/2, 1645, 1647 1/2, 1650, 1652 1/2, 1655, 1657 1/2, 1660, 1662 1/2, 1665, 1667 1/2, 1670, 1672 1/2, 1675, 1677 1/2, 1680, 1682 1/2, 1685, 1687 1/2, 1690, 1692 1/2, 1695, 1697 1/2, 1700, 1702 1/2, 1705, 1707 1/2, 1710, 1712 1/2, 1715, 1717 1/2, 1720, 1722 1/2, 1725, 1727 1/2, 1730, 1732 1/2, 1735, 1737 1/2, 1740, 1742 1/2, 1745, 1747 1/2, 1750, 1752 1/2, 1755, 1757 1/2, 1760, 1762 1/2, 1765, 1767 1/2, 1770, 1772 1/2, 1775, 1777 1/2, 1780, 1782 1/2, 1785, 1787 1/2, 1790, 1792 1/2, 1795, 1797 1/2, 1800, 1802 1/2, 1805, 1807 1/2, 1810, 1812 1/2, 1815, 1817 1/2, 1820, 1822 1/2, 1825, 1827 1/2, 1830, 1832 1/2, 1835, 1837 1/2, 1840, 1842 1/2, 1845, 1847 1/2, 1850, 1852 1/2, 1855, 1857 1/2, 1860, 1862 1/2, 1865, 1867 1/2, 1870, 1872 1/2, 1875, 1877 1/2, 1880, 1882 1/2, 1885, 1887 1/2, 1890, 1892 1/2, 1895, 1897 1/2, 1900, 1902 1/2, 1905, 1907 1/2, 1910, 1912 1/2, 1915, 1917 1/2, 1920, 1922 1/2, 1925, 1927 1/2, 1930, 1932 1/2, 1935, 1937 1/2, 1940, 1942 1/2, 1945, 1947 1/2, 1950, 1952 1/2, 1955, 1957 1/2, 1960, 1962 1/2, 1965, 1967 1/2, 1970, 1972 1/2, 1975, 1977 1/2, 1980, 1982 1/2, 1985, 1987 1/2, 1990, 1992 1/2, 1995, 1997 1/2, 2000, 2002 1/2, 2005, 2007 1/2, 2010, 2012 1/2, 2015, 2017 1/2, 2020, 2022 1/2, 2025, 2027 1/2, 2030, 2032 1/2, 2035, 2037 1/2, 2040, 2042 1/2, 2045, 2047 1/2, 2050, 2052 1/2, 2055, 2057 1/2, 2060, 2062 1/2, 2065, 2067 1/2, 2070, 2072 1/2, 2075, 2077 1/2, 2080, 2082 1/2, 2085, 2087 1/2, 2090, 2092 1/2, 2095, 2097 1/2, 2100, 2102 1/2, 2105, 2107 1/2, 2110, 2112 1/2, 2115, 2117 1/2, 2120, 2122 1/2, 2125, 2127 1/2, 2130, 2132 1/2, 2135, 2137 1/2, 2140, 2142 1/2, 2145, 2147 1/2, 2150, 2152 1/2, 2155, 2157 1/2, 2160, 2162 1/2, 2165, 2167 1/2, 2170, 2172 1/2, 2175, 2177 1/2, 2180, 2182 1/2, 2185, 2187 1/2, 2190, 2192 1/2, 2195, 2197 1/2, 2200, 2202 1/2, 2205, 2207 1/2, 2210, 2212 1/2, 2215, 2217 1/2, 2220, 2222 1/2, 2225, 2227 1/2, 2230, 2232 1/2, 2235, 2237 1/2, 2240, 2242 1/2, 2245, 2247 1/2, 2250, 2252 1/2, 2255, 2257 1/2, 2260, 2262 1/2, 2265, 2267 1/2, 2270, 2272 1/2, 2275, 2277 1/2, 2280, 2282 1/2, 2285, 2287 1/2, 2290, 2292 1/2, 2295, 2297 1/2, 2300, 2302 1/2, 2305, 2307 1/2, 2310, 2312 1/2, 2315, 2317 1/2, 2320, 2322 1/2, 2325, 2327 1/2, 2330, 2332 1/2, 2335, 2337 1/2, 2340, 2342 1/2, 2345, 2347 1/2, 2350, 2352 1/2, 2355, 2357 1/2, 2360, 2362 1/2, 2365, 2367 1/2, 2370, 2372 1/2, 2375, 2377 1/2, 2380, 2382 1/2, 2385, 2387 1/2, 2390, 2392 1/2, 2395, 2397 1/2, 2400, 2402 1/2, 2405, 2407 1/2, 2410, 2412 1/2, 2415, 2417 1/2, 2420, 2422 1/2, 2425, 2427 1/2, 2430, 2432 1/2, 2435, 2437 1/2, 2440, 2442 1/2, 2445, 2447 1/2, 2450, 2452 1/2, 2455, 2457 1/2, 2460, 2462 1/2, 2465, 2467 1/2, 2470, 2472 1/2, 2475, 2477 1/2, 2480, 2482 1/2, 2485, 2487 1/2, 2490, 2492 1/2, 2495, 2497 1/2, 2500, 2502 1/2, 2505, 2507 1/2, 2510, 2512 1/2, 2515, 2517 1/2, 2520, 2522 1/2, 2525, 2527 1/2, 2530, 2532 1/2, 2535, 2537 1/2, 2540, 2542 1/2, 2545, 2547 1/2, 2550, 2552 1/2, 2555, 2557 1/2, 2560, 2562 1/2, 2565, 2567 1/2, 2570, 2572 1/2, 2575, 2577 1/2, 2580, 2582 1/2, 2585, 2587 1/2, 2590, 2592 1/2, 2595, 2597 1/2, 2600, 2602 1/2, 2605, 2607 1/2, 2610, 2612 1/2, 2615, 2617 1/2, 2620, 2622 1/2, 2625, 2627 1/2, 2630, 2632 1/2, 2635, 2637 1/2, 2640, 2642 1/2, 2645, 2647 1/2, 2650, 2652 1/2, 2655, 2657 1/2, 2660, 2662 1/2, 2665, 2667 1/2, 2670, 2672 1/2, 2675, 2677 1/2, 2680, 2682 1/2, 2685, 2687 1/2, 2690, 2692 1/2, 2695, 2697 1/2, 2700, 2702 1/2, 2705, 2707 1/2, 2710, 2712 1/2, 2715, 2717 1/2, 2720, 2722 1/2, 2725, 2727 1/2, 2730, 2732 1/2, 2735, 2737 1/2, 2740, 2742 1/2, 2745, 2747 1/2, 2750, 2752 1/2, 2755, 2757 1/2, 2760, 2762 1/2, 2765, 2767 1/2, 2770, 2772 1/2, 2775, 2777 1/2, 2780, 2782 1/2, 2785, 2787 1/2, 2790, 2792 1/2, 2795, 2797 1/2, 2800, 2802 1/2, 2805, 2807 1/2, 2810, 2812 1/2, 2815, 2817 1/2, 2820, 2822 1/2, 2825, 2827 1/2, 2830, 2832 1/2, 2835, 2837 1/2, 2840, 2842 1/2, 2845, 2847 1/2, 2850, 2852 1/2, 2855, 2857 1/2, 2860, 2862 1/2, 2865, 2867 1/2, 2870, 2872 1/2, 2875, 2877 1/2, 2880, 2882 1/2, 2885, 2887 1/2, 2890, 2892 1/2, 2895, 2897 1/2, 2900, 2902 1/2, 2905, 2907 1/2, 2910, 2912 1/2, 2915, 2917 1/2, 2920, 2922 1/2, 2925, 2927 1/2, 2930, 2932 1/2, 2935, 2937 1/2, 2940, 2942 1/2, 2945, 2947 1/2, 2950, 2952 1/2, 2955, 2957 1/2, 2960, 2962 1/2, 2965, 2967 1/2, 2970, 2972 1/2, 2975, 2977 1/2, 2980, 2982 1/2, 2985, 2987 1/2, 2990, 2992 1/2, 2995, 2997 1/2, 3000, 3002 1/2, 3005, 3007 1/2, 3010, 3012 1/2, 3015, 3017 1/2, 3020, 3022 1/2, 3025, 3027 1/2, 3030, 3032 1/2, 3035, 3037 1/2, 3040, 3042 1/2, 3045, 3047 1/2, 3050, 3052 1/2, 3055, 3057 1/2, 3060, 3062 1/2, 3065, 3067 1/2, 3070, 3072 1/2, 3075, 3077 1/2, 3080, 3082 1/2, 3085, 3087 1/2, 3090, 3092 1/2, 3095, 3097 1/2, 3100, 3102 1/2, 3105, 3107 1/2, 3110, 3112 1/2, 3115, 3117 1/2, 3120, 3122 1/2, 3125, 3127 1/2, 3130, 3132 1/2, 3135, 3137 1/2, 3140, 3142 1/2, 3145, 3147 1/2, 3150, 3152 1/2, 3155, 3157 1/2, 3160, 3162 1/2, 3165, 3167 1/2, 3170, 3172 1/2, 3175, 3177 1/2, 3180, 3182 1/2, 3185, 3187 1/2, 3190, 3192 1/2, 3195, 3197 1/2, 3200, 3202 1/2, 3205, 3207 1/2, 3210, 3212 1/2, 3215, 3217 1/2, 3220, 3222 1/2, 3225, 3227 1/2, 3230, 3232 1/2, 3235, 3237 1/2, 3240, 3242 1/2, 3245, 3247 1/2, 3250, 3252 1/2, 3255, 3257 1/2, 3260, 3262 1/2, 3265, 3267 1/2, 3270, 3272 1/2, 3275, 3277 1/2, 3280, 3282 1/2, 3285, 3287 1/2, 3290, 3292 1/2, 3295, 3297 1/2, 3300, 3302 1/2, 3305, 3307 1/2, 3310, 3312 1/2, 3315, 3317 1/2, 3320, 3322 1/2, 3325, 3327 1/2, 3330, 3332 1/2, 3335, 3337 1/2, 3340, 3342 1/2, 3345, 3347 1/2, 3350, 3352 1/2, 3355, 3357 1/2, 3360, 3362 1/2, 3365, 3367 1/2, 3370, 3372 1/2, 3375, 3377 1/2, 3380, 3382 1/2, 3385, 3387 1/2, 3390, 3392 1/2, 3395, 3397 1/2, 3400, 3402 1/2, 3405, 3407 1/2, 3410, 3412 1/2, 3415, 3417 1/2, 3420, 3422 1/2, 3425, 3427 1/2, 3430, 3432 1/2, 3435, 3437 1/2, 3440, 3442 1/2, 3445, 3447 1/2, 3450, 3452 1/2, 3455, 3457 1/2, 3460, 3462 1/2, 3465, 3467 1/2, 3470, 3472 1/2, 3475, 3477 1/2, 3480, 3482 1/2, 3485, 3487 1/2, 3490, 3492 1/2, 3495, 3497 1/2, 3500, 3502 1/2, 3505, 3507 1/2, 3510, 3512 1/2, 3515, 3517 1/2, 3520, 3522 1/2, 3525, 3527 1/2, 3530, 3532 1/2, 3535, 3537 1/2, 3540, 3542 1/2, 3545, 3547 1/2, 3550, 3552 1/2, 3555, 3557 1/2, 3560, 3562 1/2, 3565, 3567 1/2, 3570, 3572 1/2, 3575, 3

McNab & Harlin Mfg. Co., MANUFACTURERS OF BRASS COCKS AND VALVES,



For STEAM,
WATER,
and GAS.
Wrought Iron
Pipe
and Fittings,
PLUMBERS'
MATERIALS.

Factory, Paterson, N. J.

56 John Street, N. Y.

Our new Illustrated Catalogue and Price List is now ready, and will be sent to the trade with their first order, or by express, if desired, before ordering.

RIVETS
OF EVERY
DESCRIPTION, FIRST QUALITY.
W.P. TOWNSEND & CO.
NEW BRIGHTON, PA.

3/8" T 1/2" T 1 1/4" T 1 1/2" T 1 3/4" T 2" T
COUNTERSUNK HEAD. ROUND HEAD. FLAT HEAD. STEEPLE HEAD.
BELT RIVET. WAGON BOX HEAD. ROSE HEAD. TRUSS HEAD.

5/16" 3/8" 1/2" 5/8" 3/4" 7/8" 1" 1 1/8" 1 1/4" 1 1/2" 1 3/4" 2"

H. B. NEWHALL CO., 105 Chambers Street, New York Agents.

WM. H. HASKELL, President. E. S. MASON, Treasurer. D. A. HUNT, Agent.

WM. H. HASKELL CO., MANUFACTURERS OF

**GIMLET POINT
COACH SCREWS**

Bolts, Cold-Punched Nuts & Washers,
SUITABLE FOR MACHINERY OF ALL KINDS.

Office and Works: 277 Main St., PAWTUCKET, R. I., U. S. A.

HENRY B. NEWHALL CO., Agents,
105 Chambers St., New York. 47 Pearl St., Boston.

"STAR" Bolt Works.
NORWAY IRON FANCY HEAD BOLTS,
Carriage & Tire Bolts. Star Axle Clips, &c.
TOWNSEND, WILSON & HUBBARD, 2301 Cherry Street, Philadelphia, Pa.

**THE SAMSON
WIRE STRETCHER**
is the Best, the Simple and most Portable in the Market.

Line of Draft direct; always Self-Adjusting; Rigid Double Handle; Double Pawl; it works at either end of the fence, at either side of the post and either side up.

LIGHT, PORTABLE, SIMPLE, SURE.
For sale by all leading wholesale Jobbing Hardware Houses and Barb Wire men in the United States.

MANUFACTURED ONLY BY
SAMSON NOVELTY WORKS, Nos. 14 & 16 Main St., De Kalb, Ills.
AND IN CANADA BY
BULLOCK HARDWARE CO., Otterville, Ontario.

G. W. Bradley's Edge Tools.

Butchers' Cleavers,
Butchers' Choppers,
Axes and Hatchets,
Grub Hoes and Mattocks,
Mill Picks,
Box Chisels and Scrapers,
Ring Bush Hooks,
Ax Eye Bush Hooks,
Socket Bush Hooks,
Walt's Ship Carpenters' Tools,
Carpenters' Drawing Knives,
Coopers' and Turpentine Tools.

FOR SALE BY
MARTIN DOSCHER, Agent, 85 Chambers Street, N. Y.

BOX'S PATENT RADIAL DRILLS.
Box's Patent Double-Screw Hoists.
12,000 Hoists sold. Orders continually renewed prove conclusively their superiority above all others. A liberal discount to the trade.

Elevators, Cranes, Radial Drills
—AND—
SPECIAL HOISTING MACHINERY.
Send for 1884 Illustrated Circular.

Philadelphia Office, 314 Green Street.
New York, 91 Liberty Street.
Boston, 1176 Tremont Street, and
Liverpool, England, No. 1 Hall Lane.

ALFRED BOX & CO.

**OTIS HOISTING
ENGINES.**
Standard, Hydraulic and Steam
Elevators
have been before the public for over a quarter of a Century and are now used throughout the World.

OTIS BROTHERS & CO.,
92 & 94 Liberty St., New York.

A. EDW. BARTHEL, Engineer,
111 Liberty Street, NEW YORK, P. O. Box 2837.
SOLE MANUFACTURER OF THE
REISERT, STAUFFER AND BARTHEL
**LUBRICATORS AND
SOLIDIFIED OIL.**

The most economical, perfect, practical, simplest, cheapest and elegantly finished Lubricators ever put on the market. One million sold within a couple of years. The Barthel Solidified Oil or Lubricating Compound is used with the Lubricators exclusively. Whoever has once tried this Lubricant will never again use oil or any other Lubricating Compound. Send for Illustrated Catalogue.

WM. McILVAIN & SONS,
MANUFACTURERS OF
BOILER PLATE
AND
CHARCOAL BLOOMS.

Locomotive, Fire Box, Flange and Shell Iron; Plate for Bridges and Girders; Tank and Stack Iron; Boat Plate and Iron for Wrought Pipe; Plate Iron for Fire and Burglar-Proof Safes.

TENSILE STRAIN: 56,000 to 64,000 lbs.
REDUCTION OF AREA—35 to 43 per cent.

Plates 1 1/4 inch thick to No. 14.
30 feet long.
70 inches wide.

J.H. WILLIAMS & CO.
COR. RICHARDS & BOWNE STS. (NEAR HAMILTON FERRY) BROOKLYN N.Y.
IRON AND STEEL
DROP W FORGINGS
OF THE BEST QUALITY
NEW BUILDINGS AND MACHINERY ESPECIALLY ADAPTED FOR THE BUSINESS. ESTIMATES GIVEN ON RECEIPT OF MODELS

"DAISY" FAMILY OIL CAN AND LAMP FILLER.
A 5 and 10 GALLON CAN
With an
EASY-WORKING PUMP
which adjusts to suit the height of any lamp and can be removed and left at home when Can goes to oil dealer's to be filled.

Suitable for handling
Oils, Gasoline, Turpentine, and
Druggists' Liquids in General.
Needed in every
Family, Store and Factory,
For Filling
Lamps, Bottles, Oilers, &c.

Write for TRADE Price List.
W. J. CLARK & CO., M'rs, SALEM, OHIO.
New York Office and Salesroom, 9 CHURCH STREET.

**THE GREATEST
ROCK BREAKER
ON EARTH**
CAPACITY 1 TON A MINUTE
GATES IRON WORKS
50-52 SCANAL ST. CHICAGO.

SEND FOR CIRCULARS

**P. BLAISDELL & CO.,
WORCESTER, MASS.**
Manufacturers of the
"BLAISDELL" UPRIGHT DRILLS
And other First-Class Machinists' Tools.

CHEAPEST STEAM PUMP IN THE WORLD!
THE UNIQUE
Boiler Feeder
STRICTLY FIRST CLASS
IN EVERY RESPECT.
SEND FOR
New & Reduced Price List
FREE ON APPLICATION
MANUFACTURED BY
THE MILLER COMPANY,
CANTON, OHIO.
Satisfaction Guaranteed or No Pay!

BURTON'S OPEN LINKS
Swalld Over
Indianapolis, Ind., Manu-
facturer. For
Sale by Hard-
ware Dealers
Everywhere.
Send for Cir-
culars, Prices
Terms, etc.
Large profits
to Agents.

**TINIUS OLSEN & CO.,
STANDARD SCALES
AND
Testing Machines.**
Manufacturers of all descriptions of Testing Machines. Tests made daily.
Office and Works, N. W. cor. 19th and
Huttonwood Sts., Philadelphia.

HOLT'S FORGES.
FIVE SIZES.
FOR ALL KINDS OF WORK.
\$10 and Upward.
Send for circulars.
HOLT MFG. CO.,
Cleveland, Ohio.

**THE "EDDY" STRAIGHTWAY
VALVES.**
AND
FIRE HYDRANTS.
The EDDY VALVE COMPANY
WATERFORD, N. Y.
AGENTS IN ALL PRINCIPAL CITIES.
Send for Price List.

CARRIAGE HARDWARE.
LARGEST LINE OF
WROUGHT CARRIAGE FORGINGS
MADE BY ANY HOUSE.
Send for Catalogue and Discount Sheet.
The E. D. CLAPP MFG. CO.,
AUBURN, N. Y.

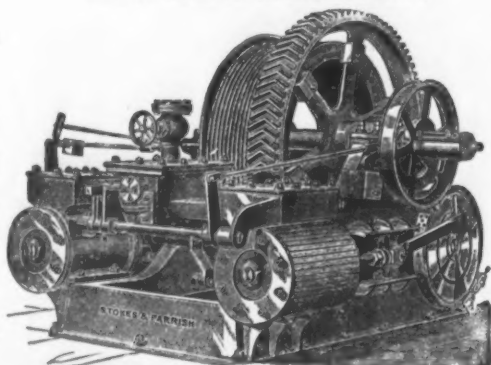
**HOWARD IRON WORKS,
BUFFALO, N. Y.,**
Manufacturers of

BENCH VISES,
Price Lists sent on application.

PITTSBURGH MFG. CO.,
Manufacturers of Nail and Spike Machines, Bolts, Nuts, Washers, Rivets, &c. Castings, Forgings and Blacksmith Work promptly attended to.
Office and Works, Railroad St., near 28th, Pittsburgh, Pa.

STOKES & PARRISH,
PHILADELPHIA.**ELEVATORS,**

Passenger and
Freight, Steam,
Hydraulic and
Belt Power.

**HOISTING
MACHINERY**

For Mines, Dock
Use and Inclined
Planes.
All kinds of
Hoisting Machin-
ery a Specialty.

BLAST FURNACE HOISTING ENGINES,

With Vertical or Horizontal Cylinders, for Handling Stock to Top of Stack with One or Two Platforms.

WORKS AND OFFICE,
3001 Chestnut St., Phila.

NEW YORK OFFICE,
95 and 97 Liberty St.

THE PUSEY & JONES COMPANY,

WILMINGTON, DELAWARE,

BUILDERS OF

**STEAM ENGINES,**

Boilers, Tanks,

MACHINERY FOR ROLL-
ING MILLS,

Punches, Shears,

Machines for Cutting off and
Sitting old Railroad Rails pre-
vious to being piled in Rolling
Mills.

Steam Riveting Machines,

Applicable to Bridge Builders' Work.

RIGHT AND LEFT ANGLE
IRON CUTTERS,

Hydraulic Bending
Machines,

AND HEAVY MACHINERY
GENERALLY.

POWER TRANSMITTING MACHINERY.

SHAFTING, HANGERS,

PULLEYS,

COUPLINGS,

CRANES

AND
MACHINE MOLDED

GEARS

A SPECIALTY.

THE WALKER MFG. CO.,

CLEVELAND, OHIO.

**HARRISON SAFETY BOILER**

FOR ALL STEAM PURPOSES

-THE BEST.-

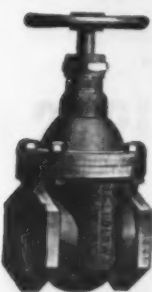
Unequaled for SAFETY, DURABILITY, ECONOMICAL
GENERATION OF DRY STEAM. Address

HARRISON SAFETY BOILER WORKS,

Germantown Junc., Phila., Pa.,

Or GRAYDON & DENTON MFG. CO., Gen'l Agts.

No. 1 Park Place, New York.

**Ludlow Valve Mfg. Co.**

OFFICE AND WORKS:

938 to 954 River St. & 67 to 83 Vall Ave., Troy, N. Y.

VALVES.

Double and Single Gate, ½ in. to 48 in.—outside and inside Screws, Indicator, &c.
for Gas, Water, Steam and Oil. Yard and Wash Hydrants. Send for Circular.

Also FIRE HYDRANTS.

DROP FORGINGS

Of Every Description a Specialty.

ADDRESS,

R. H. BROWN & CO.,

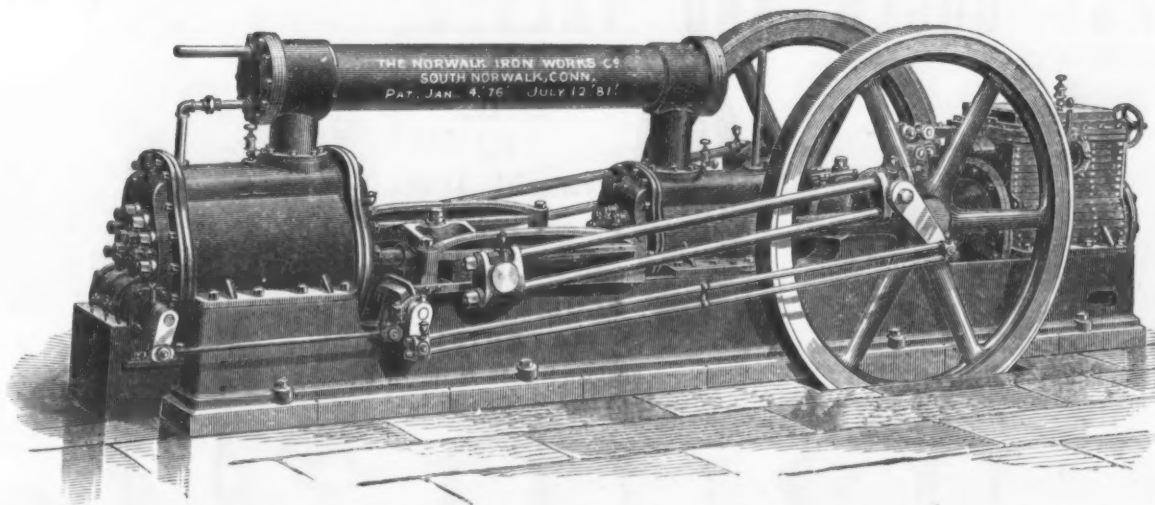
NEW HAVEN, CONN.

Also Manufacturers of

W. A. CLARK'S PATENT EXPANSIVE BIT,

CLARK'S PATENT HANDLE SCREW DRIVER,

And Other Specialties in Hardware Line.

Air Compressors.

THE NORWALK IRON WORKS CO., South Norwalk, Conn.

E. W. BLISS,

MANUFACTURER OF

Hoisting and Elevator Engines;

ALSO,

ROTARY MARINE ENGINES,

FOR

Steam Launches, Yachts and Propellers;

ALSO,

CENTRIFUGAL PUMPS,

FOR

Irrigation, Draining, Tank and Fire Purposes;

ALSO,

Water Motors and Air Pumps.

APPLY FOR CATALOGUE AND PRICES.

Office, 17 ADAMS STREET,

Brooklyn, N. Y., U. S. A.

ADJUSTABLE "DUPLEX" DIE STOCK, FOR PIPE AND BOLT

Only Die Stock with Adjustable
Self-Centering Guides.



NO LOOSE PIECES.

Send for Prices,
Discounts and De-
scription.

HART MFG. CO., 990 Payne Ave., Cleveland, Ohio.

NEW YORK OFFICE, 12 Cortlandt St., J. O. MAYNARD, Manager; BOSTON OFFICE, 101 Fort Hill Sq.,
C. E. KIMBALL, Manager; L. M. RUMSEY MFG. CO., Agents, St. Louis, Mo.; DUNHAM, CARRIGAN & CO.,
Agents, San Francisco, Cal.; J. A. SMITH, Manufacturers' Agent, Chicago, Ill.

MORSE TWIST DRILL AND MACHINE CO.

NEW BEDFORD, MASS., Sole Manufacturers of

Morse Patent Straight-Lip Increase Twist Drill,
Beach's Patent Self-Centering Chuck, Solid and Shell Reamers,

BIT STOCK DRILLS,

DRILLS FOR COES, WORCESTER, HUNTER AND OTHER HAND DRILL
PRESSES. BEACH'S PATENT SELF-CENTERING CHUCKS, CENTER
AND ADJUSTABLE DRILL CHUCKS, SOLID AND SHELL REAMERS
DRILL GRINDING MACHINES. TAPER REAMERS, MILLING
CUTTERS AND SPECIAL TOOLS TO ORDER.

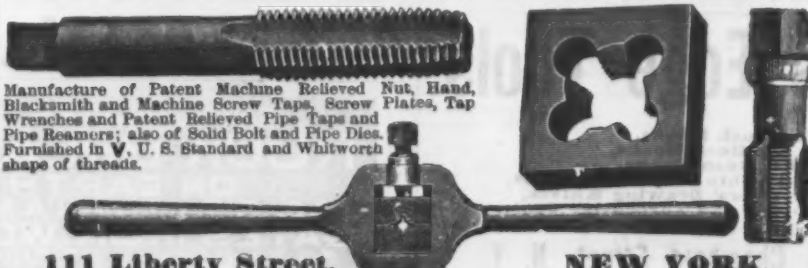
All Tools exact to Whitworth Standard Gauges.

GEO. R. STETSON, Supt.

EDWARD S. TABER, Treas.

MANNING, MAXWELL & MOORE,

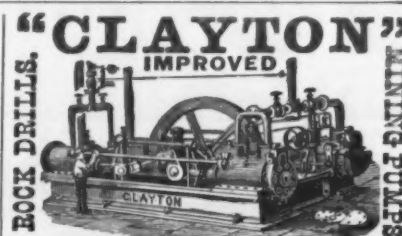
Sole Sales Agents for THE MORSE TWIST DRILL AND MACHINE CO.'S



Manufacture of Patent Machine Relieved Nut, Hand,
Blacksmith and Machine Screw Taps, Screw Plates, Tap
Wrenches and Patent Relieved Pipe Taps and
Pipe Reamers; also of Solid Bolt and Pipe Dies.
Furnished in U. S. Standard and Whitworth
shape of threads.

111 Liberty Street.

NEW YORK.

**"CLAYTON" MINING PUMPS**

For CATALOGUES, ESTIMATES, Etc. Address
CLAYTON STEAM PUMP WORKS
45 & 47 York St., BROOKLYN, N. Y.
(Near Approach to New York & Brooklyn Bridge.)

**RIVAL STEAM PUMPS**

CHEAPEST AND THE BEST FOR HOT & COLD WATER. \$35.00 AND UPWARDS.

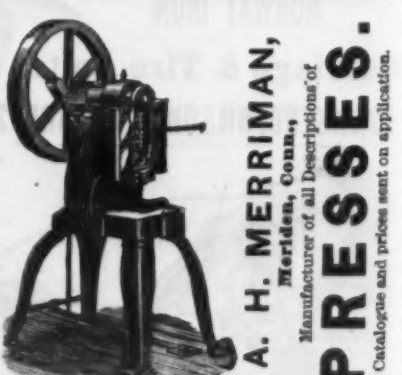
JOHN H. MCGOWAN & CO. CINCINNATI

DEAD-STROKE POWER HAMMERS.

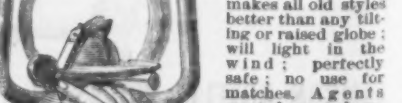
The 15 and 18 pound sizes are specially adapted for
Pneumatics, and the other sizes for general forging.
Send for circular and references.



DIEBELT & EISENHARDT,
MAKERS,
1810 Howard St., Philadelphia.

**A. H. MERRIMAN, Meriden, Conn., PRESSES.**

Manufacturer of all Descriptions of
PRESSES.
Catalogue and prices sent on application.

**LANTERN.**

Lantern Lighters,
attached to perforated
plate, fits all
Tubular Lanterns,
makes all old styles
better than any tilting
or raised globe;
will light in the
wind; perfectly
safe; no use for
matches. Agents
wanted everywhere.
Money can be made
at County Fairs and
elsewhere. Tubular
Lanterns, \$7 per doz.
Send stamp to

C. H. TYLER,
76 Beekman St., New York.

PITTSBURGH BELLOWS WORKS.

WM. FLACCUS & SON,
PITTSBURGH, PA.
Manufacture Every Variety and All Sizes of
BLACKSMITH BELLOWS.
Superior Quality, covered with own make best
Oak-Tanned Leather.

Machinery, &c.

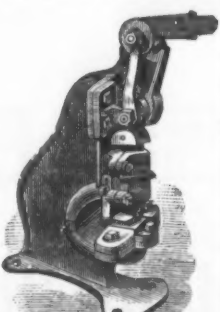
LYON'S HAND OR POWER PUNCHES AND SHEARS.



For Round, Flat or Square Iron.
Polishing & Buffing Machinery,
HYDRAULIC JACKS

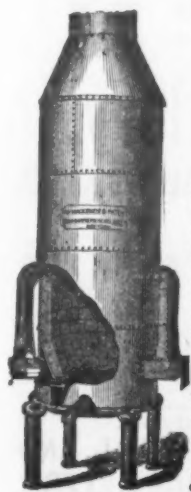
(IMPROVED 1884).
To raise from 4 to 150 tons.
Hydraulic Presses for Special & General Use.
HYDRAULIC HAND & POWER PUMPS
1 to 6 plungers, for uniform or changeable speed.

WATSON & STILLMAN
(Successors to E. LYON & CO.),
470 H Grand Street, NEW YORK.
Send for circular of what you want.

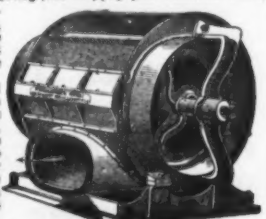


THE MACKENZIE PATENT
CUPOLA & BLOWER.

Send for circular to
Smith & Sayre Mfg. Co.,
PROPRIETORS, 245 Broadway, New York.



This Cupola has made a great revolution in melting iron. It differs from all others in having a continuous tuyere, or in other words, the blast enters the fuel at all points. Above one ton capacity per hour, they are made oval in form. This brings the blast to the center of the furnace with the least resistance and smallest possible amount of power, and in combination with the continuous Tuyere causes complete diffusion of the air throughout the furnace, and uniform temperature, melting ten or fifteen tons an hour with the pressure of blast required to melt two or three tons in an ordinary Cupola. It also enables us to save very largely in time and fuel, the experience of our customers showing a gain of twenty-five to fifty per cent. in time, and twenty-five to forty per cent. fuel over the ordinary Cupola, and a BETTER QUALITY OF CASTING, especially in light work. This is due to the thorough diffusion of the air and more perfect combustion, extracting less carbon from the iron, making a softer and tougher casting. We manufacture these Cupolas of any desired capacity, numbered from 1 to 20, inclusive, the numbers denoting the melting capacities in tons per hour—No. 1, one ton; No. 2, two tons; No. 3, three tons per hour, and so on up to 20. We have improved the construction of these Cupolas in every way, have increased their strength and durability, and sought to make them as convenient for working and repairs as our own and the experience of our customers could suggest.



"OTTO" GAS ENGINE.

OVER 14,000 IN USE.

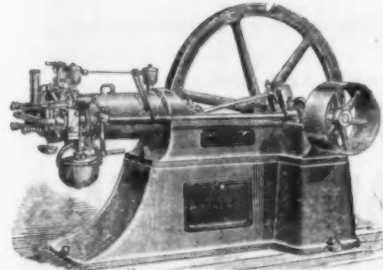
20 to 70 per Cent. Less Gas Consumption per Brake Horse-power Than Any Other Engine.

TWIN ENGINES.

One Impulse Every Revolution
ENGINES AND PUMPS COMBINED.

For Hydraulic Elevators Town Water Supply and Railway Service.

1 TO 25 IND HORSE-POWER
SCHLEICHER, SCHUMM & CO.,
N. E. Cor. 33d & Walnut Sts., Philadelphia.
214 Randolph St., Chicago.



STEPHEN A. MORSE.

C. M. WILLIAMS.

EDWIN F. MORSE.

SEND FOR CIRCULARS.

CLEM & MORSE,

LATEST PATENTED IMPROVEMENTS.

ELEVATORS

Hoisting Machinery, Automatic Hatch Doors, &c.

413 Cherry St., PHILADELPHIA, PA. Branch Office, 108 Liberty St., NEW YORK.

BAGNALL & LOUD,

BOSTON, MASS.

Sole Manufacturers in U. S. A. of our Celebrated

METALINE
AND
Improved Sleeve Roller
Bush Tackle Blocks.

Also a full line of every variety of TACKLE BLOCKS.
Try Us with a Sample Order.
Send for Illustrated Catalogue.
New York Warehouse, 33 South Street.

Western Agency: C. H. GURNEY & CO., 247 Lake St., CHICAGO.



Clasp opened.



Clasp closed.



IRON ROOFING.

Extra quality. Best plan in use. (Sold as low as any other.)

MANUFACTURED BY

T. C. SNYDER & CO., Canton, Ohio

Cheap, strong and durable. Does not get out of repair. Every roof sold in even years satisfactory. Any mechanic can apply it. Circular and sample free. Also manufacturers of the best and cheapest Metallic Paint in use.



First-Class, Heavy, Double & Treble Geared Engine Lathes,
Horizontal Boring Lathes, Fox Lathes, Lifting Jacks and Cornice Machinery.

GEORGE A. OHL & CO., East Newark, N. J.

DRILL PRESSES.



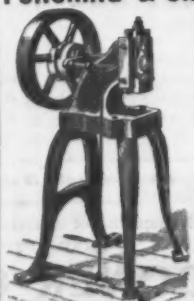
New Upright Power Drill Presses, No. 1, swings 21 inches; back-gear, quick return. A strong iron brace extends from base to head of column—a new feature. Weight, 1100 lbs.; height, 6 feet. Price, \$210.

No. 1 1/2, on legs, swings 15 1/2 inches, 4 speeds. Price, \$75.

No. 1 size, to set on bench, swings 11 inches, lever feed, 3 speeds, tight and loose pulleys. Price, \$35.

Patents Punch & Shear Co.,
38 W. Day Street, New York.

PUNCHING & SHEARING PRESSES.



Power, Foot or Hand
PUNCHES
AND
SHEARS.

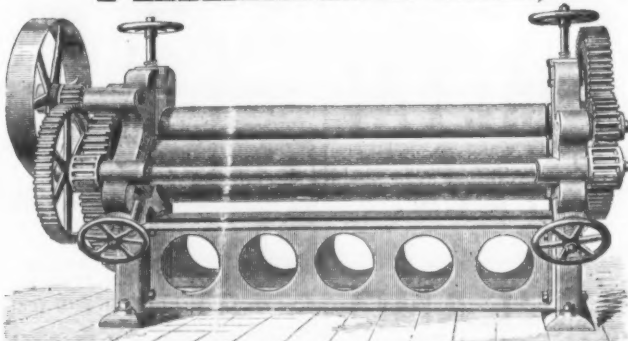
All sizes, from \$25 to \$1000.

DRILL PRESSES, LATHES, SHAPERS, BOILER ROLLERS, STEEL HAMMERS, ALL SIZES, LOW PRICES.

Patents Punch & Shear Co.,
38 W. Day St., New York.

Machinery, &c.

WILLIAM SELLERS & CO.,
PHILADELPHIA,



MANUFACTURERS OF

IRON AND STEEL WORKING MACHINERY,
MACHINISTS' TOOLS, SHAFTING, GEARING, &c., INJECTORS.

BRANCH OFFICE:

79 Liberty Street, NEW YORK.

SOUTHWARK FOUNDRY &
MACHINE CO.,

430 Washington Ave., PHILA., PA.

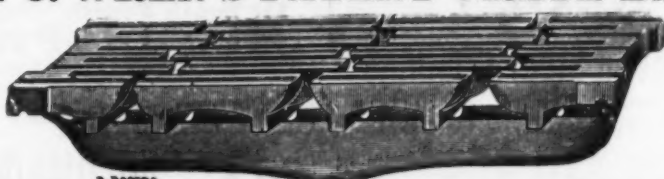
ENGINEERS AND MACHINISTS.

BLOWING ENGINES AND
HYDRAULIC MACHINERY.

SOLE MAKERS OF THE

PORTER-ALLEN AUTOMATIC CUT-OFF
STEAM ENGINE.

W. C. WREN'S PATENT GRATE BAR.



DAVID S. CRESWELL,

MANUFACTURER,

816 Race Street, Philadelphia, Pa.
The Most Durable Grate Bar on the Market. Send for circular and price list.

HALL'S PATENT

AUTOMATIC
INJECTORS,

For supplying all classes of Steam Boilers with water. These injectors are the Best, Simplest and only thoroughly Reliable Boiler Feeders in the world, working from 2 lbs. to 200 lbs. steam pressure.

10,000 NOW IN USE.

Send for prices and particulars.

HALL'S ENGINEERING CO.,

112 John St.,

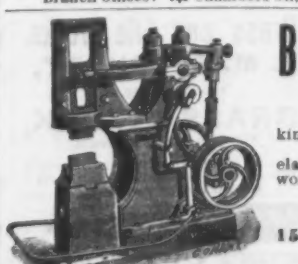
NEW YORK.

THE CLERK GAS ENGINE.

Highest Award for Gas Engines at American Institute Fair, New York, 1883.

Makes an ignition at every revolution of the Fly Wheel. Is started with ease, and gives full power immediately. No danger from fire; no extra insurance nor skilled engineer required. Runs perfectly steady; only uses gas when required. Workmanship of the best description and guaranteed. Indicated power considerably larger than in any other Gas Engine of the same size, each Engine giving from 1 H.P. to 4 H.P. more than named. Is unsurpassed by any other Gas Engine for running any kind of machinery or electric light, arc or incandescent. Has means for regulating to suit any coal or water gas.

No Boiler, Coal, Ashes or Engineer. Made in Sizes of 4, 8, 10, 15 and 25 H.P.
THE CLERK GAS ENGINE CO., 1012-1016 Filbert St., Philadelphia.
Branch Offices: 142 Chambers St., New York; 4 West 14th St., New York; 76 Dearborn St., Chicago.



BEAUDRY'S UPRIGHT POWER HAMMER.

SIMPLE, PRACTICAL AND LOW-PRICED.

This Hammer is of an entirely new design and adapted to all kinds of work. It strikes a direct upright blow, and is given with the same elasticity as by a blacksmith's arm, and thus does not chill the work.

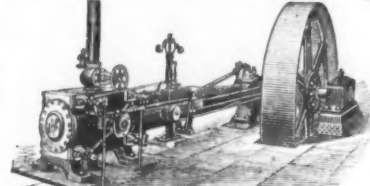
ALEXANDER BEAUDRY,

150 Portland Street, BOSTON, MASS.

For full Description and Testimonials, Send for Circular.

Machinery, &c.

CORLISS ENGINE BUILDERS
"ECONOMY & DURABILITY"



MACHINISTS IRON FOUNDERS
BOILER MAKERS
ROBT WETHERILL & CO.
CHESTER, PA.

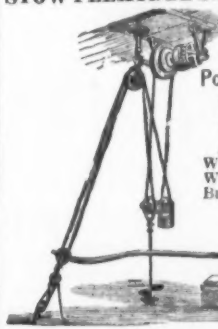
STOW FLEXIBLE SHAFT CO., Limited

15th & Pennsylvania Ave.
PHILADELPHIA, PA.,
Manufacturers of

Portable Drilling, Tapping, Reaming and Boring Machines.

Also, Tools for Emery Wheel Grinding, Metal & Wood Polishing, Cattle Brushing & Clipping, &c.

General European Agents,
HOLLING & LOWE, 2 Lawrence Pountney Hill, London, England.



PHILA. SHAFTING WORKS.

GEO. V. CRESSOP,
18th & Hamilton St.,
PHILADELPHIA.

SHAFTING
A SPECIALTY

Manufacturers of
Shafting, Pulleys and Hangers, Couplings and every apparatus used in the TRANSMISSION OF STEAM POWER.

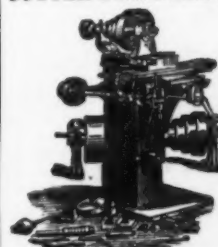


E. E. GARVIN & CO.,

Machinists and Manufacturers of

Milling Machines, Drill Presses,
HAND LATHES, TAPPING MACHINES,

CUTTER GRINDERS & WOOD PLANERS



Milling Cutters, all Shapes and Sizes
Gear Cutting and Milling in all its branches.
Index Plates Drilled Accurately. Special Tools and Machinery Designed and Built to Order.

Power Milling Machine.
141 Centre St. New York. Send for Illustrated Catalogue.

Established 1867.

E Harrington, Son & Co.,

MANUFACTURERS OF

PATENT EXTENSION AND SCREW CUTTING

LATHES

Iron Planers,
Radial, Upright, Suspension Multiple and Lever

DRILLS,
and a variety of other MACHINISTS' TOOLS

Patent Double Chain Screw Pulley Blocks,
Unrivalled for Durability, Safety and Power.

Patent Double Chain Quick-Lift Hoists,
with Brake for quick and easy lowering.

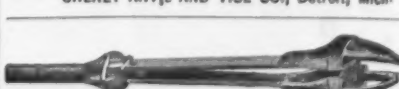
Circulars furnished. WORKS AND OFFICE,
Cor. N. 15th and Penna. Ave. Philadelphia, Pa. U. S. A.
Represented by J. Q. MAY, N. Y.
N. Y. 12 Cortlandt St., N. Y.
C. E. KIMBALL, 101 High St., Boston, W. H. RICE, 115 Main St., Cincinnati.



An Anvil; A Vise, with Adjustable Jaw, and a Cutting-Off Tool.



For Descriptive Circulars and Trade Discounts address
CHENEY ANVIL AND VISE CO., Detroit, Mich.



WE CHALLENGE THE WORLD FOR ITS EQUAL.
The cheapest, most durable and effective Tool for Cleaning Tubes Hot or Cold.

RUFFNER & DUNN, Schuylkill Falls, Philadelphia, Pa.
Patentees and Sole Manufacturers of the EXCELSIOR STEEL TUBE CLEANER. Most liberal discount to dealers. Send for Circulars.

G. E. BRETTELL,

Furnace Street, Rochester, N. Y.

Planers a Specialty. 25 x 25, 30 x 25 and 30 x 30 in. to plan 7 and 10 ft. long. Send for Price List.



G. E. BRETTELL, Rochester, N. Y.

TUBAL SMELTING WORKS,

760 & 762 Broad Street, PHILADELPHIA.

PAUL S. REEVES,

MANUFACTURER OF

GENUINE BABBITT METAL

AND ALL GRADES OF

ANTI-FRICTION METALS.

ESTABLISHED 1842.

WM. & HARVEY ROWLAND,

PHILADELPHIA.

P. O. Address: Frankford, Philad'a.

MANUFACTURERS OF ALL KINDS OF

Elliptic, Platform & C Springs,

"Brewster Side-Bar Combination Patented" Springs and
Timken's Patent Cross Springs,

Reiff's Patent, Groot's Patent, Champion Spring, Carter Patent and Saladee's Patent
Crescent Springs,

MADE EXCLUSIVELY FROM

SWEDISH STOCK, OIL-TEMPERED and WARRANTED.

Swedish Tire, Toe, Blister and Spring Steel.

CAST SPRING AND PLOW STEEL.
CAST SHOVEL, HOE AND MACHINERY STEEL

OXFORD TOE SLEIGH, TIRE AND SPRING STEEL.
BESSEMER SHOVEL AND PLOW STEEL.

BESSEMER MACHINERY AND CULTIVATOR STEEL.

RE-ROLLED NORWAY SHAPES.
NORWAY NAIL RODS ROLLED AND SLIT FROM SUPERIOR BRANDS.

STEEL CASTINGS

FROM 1-4 TO 15,000 LBS. WEIGHT.
True to pattern, sound and solid, of unequalled strength, toughness and durability. An invaluable substitute for forgings, or for cast iron requiring three-fold strength. Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc. 2,000 Crank Shafts and 15,000 Gear wheels of this steel now running prove its superiority over other Steel Castings. CRANK SHAFTS, CROSSHEADS AND GEARING SPECIALTIES. Steel Castings of every description. Please send for our Circulars and Prices. Address:
CHESTER STEEL CASTINGS CO.,
Works, Chester, Pa. 407 Liberty St., Philadelphia.

PITTSBURGH STEEL CASTING CO.,
26th and Railroad Streets, PITTSBURGH, PA.

MANUFACTURERS OF

Refined Bessemer Steel; Improved Steel Castings
Under Hainsworth's Patents.

We are now prepared to fill orders for refined **BESSEMER BILLETS or BLOOMS** of any desired carbon and a uniform quality.

We would call attention of consumers to the fact that we use good material, and produce a steel pronounced by competent judges equal to the best English or German spring and soft steels.

Having had twelve years' experience in the making of **STEEL CASTINGS**, we are able to refer to our customers in all parts of the United States and Canada as to the quality of our work in this line. We make castings of steel practically free from blow-holes, as soft and easily worked as wrought iron, yet stiff, strong and durable, with a tensile strength of not less than 65,000 pounds to the square inch. In short, our castings unite the qualities of steel and wrought iron.

Wheels, Pinions, Cranks, Dies, Hammer Heads, Engines and Machinery Castings of all descriptions, Railroad Frogs and Crossings, Plowshares, Moldboards and Landslides. Special attention given to Heavy Castings. We use no cast iron in our castings. Send for circular.



Punching Presses.

DIES AND OTHER TOOLS

FOR THE MANUFACTURE OF ALL KINDS OF
SHEET METAL GOODS,
DROP FORGINGS, &c.

Stiles & Parker Press Co.,
MIDDLETOWN CONN.

Branch Factory and Office, 59 DUANE STREET, NEW YORK.



NO FLANGED WHEELS.

Warner's Patent

SLIDING

DOOR HANGERS

Manufactured by
E. C. STEARNS & CO.,
Syracuse, N. Y.

500 SETS
SOLD BY
WM. BLAIR & CO.,
Chicago, Ill.

Send for Illustrated Catalogue.

BRADLEY'S HEATING FORCES.

For Hard Coal or Coke.

INDISPENSABLE IN ALL SHOPS

to keep Bradley's Cushioned Hammers and men fully employed, and reduces cost of production.

BRADLEY & COMPANY,
SYRACUSE, N. Y.

(ESTABLISHED 1832.)

STANLEY G. FLAGG & CO.
PHILADELPHIA, PA.
Office and Works,
N. W. cor. 19th St. & Pennsylvania Ave.
MANUFACTURERS OF

STEEL CASTINGS.

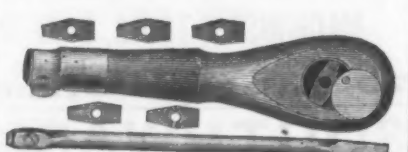
A Substitute for Steel & Wrought Forgings.
Circulars sent on application.

STEEL CASTINGS

Railroad and Machine Castings,
1/2 lb. to 10 tons. Locomotive Cross
Heads and Gearing a Specialty.
EUREKA CAST STEEL CO.
Chicago Office, Grand Pacific Hotel.
307 WALNUT STREET, PHILADELPHIA.

PRATT'S

Multiform Screw Driver.



Twelve screw drivers in one. The points, as seen in the cut, are of various widths and thicknesses to fit all size screws. They are held in the stock by a screw. This screw may be turned by one of the points held in the fingers. These points operate much better than an ordinary driver, as they are not ground to a bevel. The bit can readily be taken out of the handle and used in a bit brace.

Handle, polished rosewood... 7 inches long.
Bit 3/4 round steel... 7 inches long.

It is the most useful and beautiful screw driver which was ever put on the market. Price by mail, prepaid, \$1. Hardware dealers will furnish it at same price.

MILLERS FALLS CO.,
74 Chambers St., New York.

AGENTS IN ALL FOREIGN COUNTRIES.

HOWSON'S PATENT OFFICES

119 South Fourth Street,
PHILADELPHIA
Branch Office, 605 Seventh St. Washington, D. C.
H. HOWSON, Engineer and Sculptor in Patents.
G. HOWSON, Attorney at Law and Counsel in Patent Cases.
SEND FOR CIRCULARS.

COLUMBIA BICYCLES.
The Popular Steeds for Business and Pleasure.

COLUMBIA TRICYCLES.
For Ladies and Gentlemen.
Send Stamp for Illustrated (35-P.) Catalogue.
The Pope Mfg. Co.
597 Washington St., Boston, Mass.
Branch House, 12 Warren St., N. Y. City

THE BEST IN USE.

DUK'S IMPROVED ELEVATOR

This is the only scientifically constructed bucket in the market. It is struck out from charcoal stamping iron (steel). "No corners to catch." "No seams to burst." "No interior corners to clog up." It runs with great ease and half the power of the old-style bucket. Will outwear half a dozen of them. **Prices Reduced.**

IRON CLAD MFG. CO., Sole Mfrs.,
22 Cliff Street, NEW YORK.

A. G. PECK & CO.,
Cohoes, N. Y.,
MANUFACTURERS OF
AXES, ADZES, BROAD AXES, HATCHETS.
Send for Catalogue and Price List.

Scranton Brass and File Works.
J. M. EVERHART,
Manufacturer of
BRASS WORK,
For Water, Gas & Steam.
Exhaust Steam Injector, using waste steam only, returning it to boiler with water at 150 degrees.
Also, PATENT CUT FILES.
SCRANTON, PA.

RUSSELL, BURDSALL & WARD,
PORTCHESTER, N. Y.,
MANUFACTURERS OF

CARRIAGE, TIRE, BOLTS, PLOW, STOVE, &c.

Carriage Bolts made from Best Square Iron a Specialty.

JOHN RUSSELL CUTLERY CO.,

Green River Works,
MANUFACTURERS OF

Table and Pocket Cutlery,

BUTCHERS', HUNTERS', PAINTERS', DRUGGISTS' & HOUSEHOLD KNIVES

IN ALL STYLES AND VARIETIES.

OLDEST AND LARGEST AMERICAN MANUFACTURERS.

Factories,



Turners Falls, Mass.

F. W. WURSTER,
IRON FOUNDRY
AND AXLE WORKS,
150 to 149 First St.,
Brooklyn, N. Y.

AXLES

SUPERIOR
WAGON, CART AND
CARRIAGE AXLES.
Our facilities enable us to quote the
trade lower prices than any other
manufactory. Send for price list.

J. M. CARPENTER
PAWTUCKET, R. I.

MANUFACTURER OF TAPS AND DIES.

E. A. C. DU PLAINE,

ANTI-FRICTION & BABBITT METALS

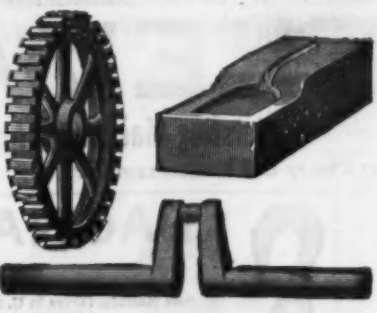
CHICAGO.

XXX Du Plaine's Patent Nickel Babbitt.
XX Du Plaine's Nickel and Copper Babbitt.
X Du Plaine's Genuine Copper Babbitt.
AA Du Plaine's Genuine Phosphor Babbitt.

A Genuine Babbitt (so called by other makers.)
B Lubricating Babbitt.
C Adamantine Babbitt.
No. 1 Hardware Babbitt (very hard).

WRITE BEFORE ORDERING ELSEWHERE.

SOLID STEEL CASTINGS,



FROM CRUCIBLE and OPEN HEARTH.

HYDRAULIC CYLINDERS AND GEARING SPECIALTIES.

CUN METAL ROLLS, PINIONS and CASTINGS.

AIR-FURNACE REFINED MALLABLE CASTINGS.

All Stock used by us is subject to Chemical Analysis in our own Laboratory.

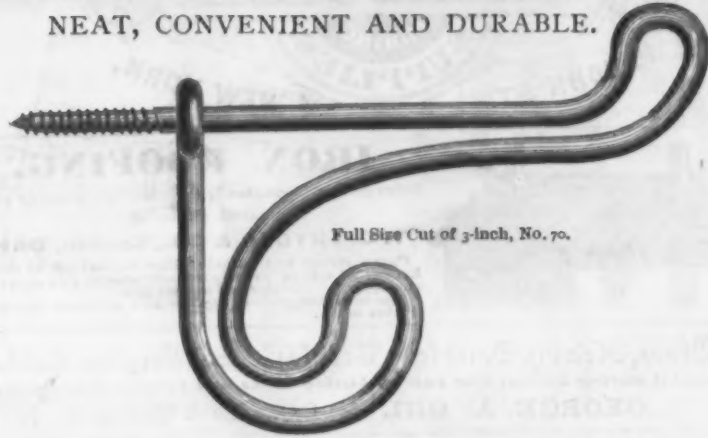
ISAAC C. JOHNSON & CO.,

Established 1853.

SPUYTEN DUYVIL, NEW YORK CITY.

Gem Wire Coat and Hat Hooks

NEAT, CONVENIENT AND DURABLE.



Full Size Cut of 3-inch, No. 70.

Size.	Walnut Bronzed.	Nickel Plated.	Polished Brass.
	No. Per Gross.	No. Per Gross.	No. Per Gross.
2 inch.....	50.....\$1.75	450.....\$4.75	750.....\$10.00
2 1/2 ".....	60.....2.00	460.....5.00	760.....11.00
3 ".....	70.....2.40	470.....5.40	770.....13.50
3 1/2 ".....	80.....3.00	480.....6.00	780.....16.50

For Discount, see Wholesale Hardware Prices in this Paper.

Send for Catalogue and Discounts of American and Gem Spring Hinges, Door Springs, &c.

MANUFACTURED BY

VAN WAGONER & WILLIAMS CO
82 BECKMAN STREET, NEW YORK.